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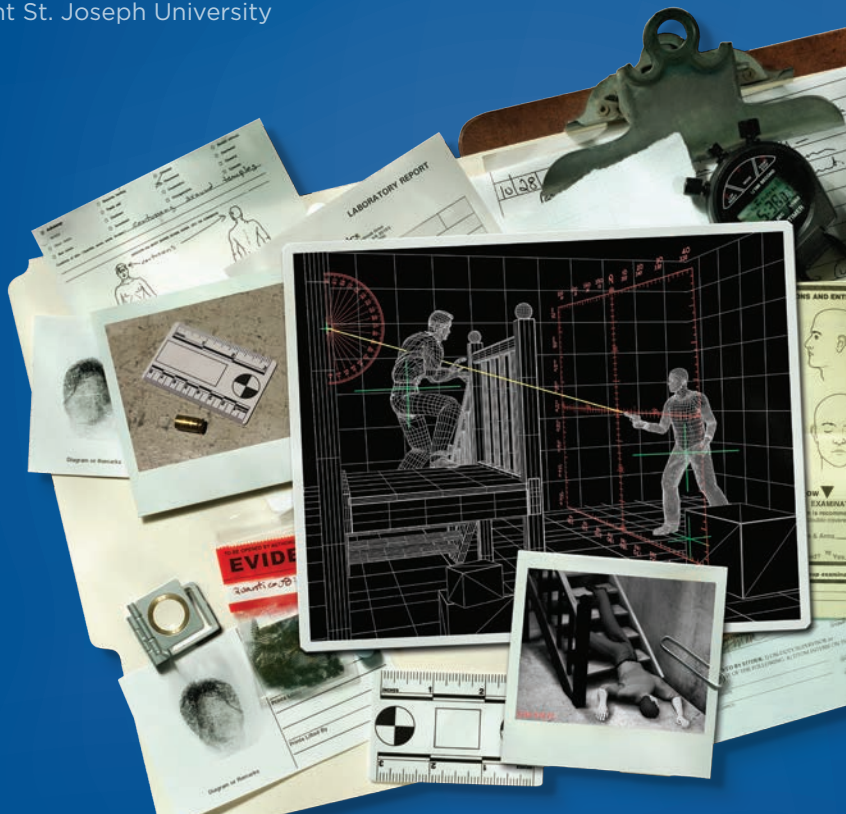
Topic
Science
& Mathematics

Subtopic Biology

Forensic History: Crimes, Frauds, and Scandals

Course Guidebook

Professor Elizabeth A. Murray
Mount St. Joseph University



PUBLISHED BY:

THE GREAT COURSES

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Chantilly, Virginia 20151-2299

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www.thegreatcourses.com

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Dr. Elizabeth A. Murray is a forensic anthropologist who is also a Professor of Biology at Mount St. Joseph University, where she teaches doctoral-level cadaver-based human gross anatomy and undergraduate-level forensic science, vertebrate anatomy and physiology, musculoskeletal anatomy, and medical terminology. She is also an adjunct affiliate of the University of Cincinnati College of Medicine. Dr. Murray received her bachelor's degree in Biology from the College of Mount St. Joseph, and she received her master's degree in Anthropology and her doctoral degree in Interdisciplinary Studies in Human Biology from the University of Cincinnati.

Dr. Murray is an award-winning teacher who has received the Sears-Roebuck Foundation Teaching Excellence and Campus Leadership Award and who has twice earned the Clifford Excellence in Teaching Award. She has also served as an instructor for numerous professional organizations, including the training academy of the U.S. Department of Justice/National Institute of Justice's National Missing and Unidentified Persons System (NamUs), the American Academy of Forensic Sciences (AAFS) Student Academy, the Armed Forces Institute of Pathology, the Wayne State University School of Medicine's Medicolegal Investigation of Death program, the Ohio State Coroners Association, and the International Association of Coroners & Medical Examiners.

Most of Dr. Murray's regular forensic casework has been in Ohio and Kentucky, where she has participated in hundreds of forensic investigations involving skeletal, decomposing, burned, buried, and dismembered human remains. A Fellow of the AAFS, she is one of fewer than 100 anthropologists who are certified as Diplomates by the American Board of Forensic Anthropology (ABFA). Dr. Murray is on the Board of Directors of the ABFA

and is the Forensic Anthropology Consultant on the “Ask the Experts” Panel of the National Organization of Parents of Murdered Children. She is also on the Mass Disaster Team for the Cincinnati/Northern Kentucky International Airport and has served on the Board of Trustees for The Forensic Sciences Foundation.

In 1994, Dr. Murray was recruited by the Armed Forces Institute of Pathology to participate in morgue operations after the crash of American Eagle Flight 4184 in Roselawn, Indiana. She also served as a visiting scientist to the U.S. Army Central Identification Laboratory, for which she led a team of military personnel in the recovery of a Vietnam War-era plane crash site in the jungle of Laos. As a consultant and on-screen personality for the National Geographic Channel’s *Skeleton Crew* (aired internationally as *Buried Secrets*), Dr. Murray was dispatched to observe and participate in fieldwork with the Guatemalan Forensic Anthropology Foundation. This four-part miniseries showcased the uses of forensic anthropology in analyzing historical mysteries and modern forensic contexts. In addition, Dr. Murray served as a regular cast member on the Discovery series *Skeleton Stories* and has appeared on such television shows as *America’s Most Wanted*, *Forensic Files*, *The Decryters*, and *The New Detectives: Case Studies in Forensic Science*.

Dr. Murray’s publications include numerous entries in the *Proceedings*, published by the AAFS, as well as books and chapters covering both historical and forensic anthropological analyses. Dr. Murray’s book *Death: Corpses, Cadavers, and Other Grave Matters* was named one of the 2011 top 10 summer reads for students by the American Association for the Advancement of Science. Her second book, *Forensic Identification: Putting a Name and Face on Death*, was selected by the National Science Teachers Association/Children’s Book Council as one of the Outstanding Science Trade Books for Students K–12 for 2013. Her most recent book is *Overturning Wrongful Convictions: Science Serving Justice*. For The Great Courses, Dr. Murray also taught *Trails of Evidence: How Forensic Science Works*. ■

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Acknowledgements

First of all, many thanks to my sister, Kathy Isaacs, who served as my research assistant during the development of this course and loves a great story as much as I do. I'd also like to thank those at New Dominion Pictures for introducing me to the Colorado Cannibal and other amazing historic forensic cases through our filming of the *Buried Secrets* miniseries in 2004, including coverage of the Forensic Anthropology Foundation of Guatemala (FAFG). I wish to honor Fredy Peccerelli and those at FAFG for their humanitarian work and express my gratitude for the opportunity to learn from them. Appreciation is due to my forensic anthropology colleagues Dr. Norm Sauer and Brian Spatola for specific information about Nazi artifacts. I also owe a great debt of thanks to the professionals at the Hamilton County Coroner's Office, where I first began my adventure into forensic casework in 1986. Their support for Project Identify has been invaluable, in particular, the work of Andrea Hatten and Dr. Bill Ralston; thanks to all those at the office for allowing me to relate the stories of this project and others in this series. I am also grateful to Investigator Mike Ratliff of the Scioto County Coroner's Office, as well as the talented forensic artist Catyana Skory-Falsetti. My work with the unidentified has been enriched by the inception of the National Missing and Unidentified Persons System (NamUs), and I hope that the families of Arthur R. Flowers and Paula Beverly Davis, especially her sister, Stephanie Clack, may find peace. My students at Mount St. Joseph University also deserve recognition for discovering some amazing historic case stories in our forensic science courses that became the bases for several of these lectures. Last but certainly not least, I am extremely grateful for the keen eye of Susan Dyer, who did a superb job of editing all my lecture scripts; Nancy Eskridge for her ongoing support; and all the other wonderful people at The Great Courses with whom I worked on this project. ■

Forensic History: Crimes, Frauds, and Scandals

Scope:

This course is a journey through time and place from the perspective of forensic science and criminal history. It examines technological advancements and political and legal issues and demonstrates how science and society relate to each other, especially with regard to criminal investigations. The lectures use a case-based approach—including some of Dr. Murray’s own forensic casework—to focus on historic forensic issues and show how new evidence or more advanced technology can sometimes be used to develop alternative conclusions or finally solve cold cases. At times, we consider how historic crimes would have different outcomes if they occurred today.

The first lecture looks at the Jack the Ripper murders of 1888 in London’s East End. A surprising amount of forensic science was in use at the time, yet the identity of the killer is still unknown. In Lecture 2, we examine the case of the woman known as the Black Dahlia, found in Los Angeles in 1947, comparing her death to those in the Jack the Ripper series. We then turn to three mysterious Hollywood deaths—those of George Reeves, Bob Crane, and Bruce Lee—and review a brief history of the use of autopsy to resolve suspicious deaths. Lecture 4 highlights the fact that initial appearances can sometimes be deceiving and illustrates how the decomposition process can affect autopsy results. We next explore two infamous “family feuds” that took place nearly 100 years apart: the cases of Lizzie Borden and the Menendez brothers. Lecture 6 examines the 1982 Tylenol murders, in which seven people died after taking cyanide-laced acetaminophen capsules, and provides a rich backstory on the prime suspect.

Lectures 7 and 8 cover a series of copycat crimes, hoaxes, and frauds, including copycat product-tampering cases, the famous Piltdown fossil hoax, the attempt of a British politician to fake his own death, and art and other forgeries. Lecture 9 presents sports scandals, including the use of performance-enhancing drugs by Lance Armstrong and others, as well as Olympic figure skater Tonya Harding’s sabotage of a competitor and the

infamous Chicago “Black Sox” scandal. Old and new political sex scandals are examined in Lecture 10, with a discussion of how DNA testing and other forensic methods are now used to document them. In Lecture 11, we move to the Wild West to see how criminals can become cult figures. Cases include the gunfight at the O.K. Corral, the James Gang, and the Colorado Cannibal. In Lecture 12, we follow the investigation of two amazing bank heists using a variety of forensic methods.

Moving in a new direction, Lectures 13 through 16 demonstrate how the legal system sometimes fails badly, charging or even convicting the innocent of crimes they did not commit. The pitfalls in such cases include faulty eyewitness testimony, mistaken or corrupt law enforcement agents, planted evidence, legal malpractice, and improper or misused forensic science. In these four lectures, we look at the causes behind false confessions and see how the criminal justice system can and has learned from its mistakes and reformed some police and legal procedures. Recent cases of exoneration in the United States, particularly through the use of DNA technology, illustrate how terrible wrongs can be addressed, even though the years spent in prison by the innocent can never be recovered.

Political assassinations are a global forensic phenomenon, and in Lecture 17, we look at the unusual murder of Bulgarian dissident Georgi Markov, the killing of Olaf Palme of Sweden, and the questioned death of Palestinian leader Yasser Arafat. Lecture 18 is devoted to the mysteries surrounding the murders of the Romanov family of Russia, including how forensic anthropology and DNA were used to identify the victims almost 100 years after their deaths. In Lecture 19, we examine acts of genocide, with special attention to ongoing work uncovering mass graves in Guatemala. In Lecture 20, we visit the Buchenwald work camp of the Nazis and analyze the allegations against Ilse Koch, also known as the Witch of Buchenwald. This set of politically related investigations concludes with coverage of famous spies, among them, Mata Hari and FBI agent Robert Hanssen.

With Lecture 22, we turn to kidnappings, using motive as part of the backdrop of our study; examples here include the massacre at the 1972 Munich Olympics, the kidnapping of J. Paul Getty III, infant abductions, and a case that introduces the use of the National Missing and Unidentified

Persons System (NamUs). Lecture 23 highlights six recent John and Jane Doe cases, showing how new evidence and information can be gathered to help identify the unknown dead. The final lecture focuses on three issues that have dramatically altered case resolution or the commission of crimes throughout history: advances in fingerprint technology, DNA profiling, and computerization.

Through this exploration of fascinating cases from both the history books and today's headlines, not only will you discover how science is applied to criminal investigations, but you'll also sharpen your analytical skills and learn to evaluate evidence critically—skills you can bring to bear when the next crime or forensic mystery hits the news. ■

The Infamous Jack the Ripper

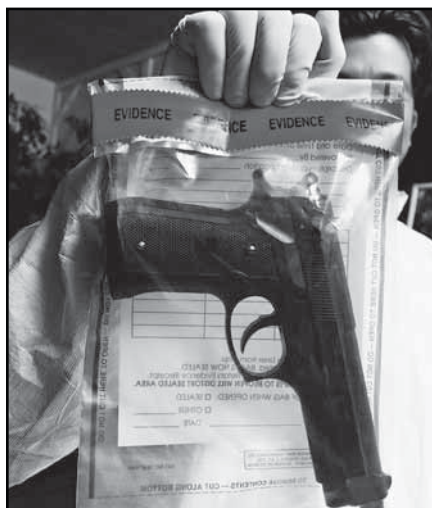
Lecture 1

Outside of personal experience as either a victim or a perpetrator, how do we know what we know about crimes? As long as there has been written language, historians have recorded landmark events, including the lives—and deaths—of famous people and unusual events involving ordinary people. Today, much of our knowledge of crime victims comes from the media, which is also a source for history. Of course, the landmark case for media interest in crime is that of Jack the Ripper. This case has spawned hundreds of theories and countless publications and has been reexamined by some of forensic science's greatest minds. But despite all these efforts, we still do not know the identity of the perpetrator.

Basic Forensic Analysis

- Although the exact number of victims is not known, most authorities agree that five women killed in the Whitechapel area of east London between August 31 and November 9 of 1888 are the work of the same serial killer.
- The reason most agree that these five female victims are definitively linked is based on what forensic scientists call *modus operandi* (MO).
 - All of the definitive victims were prostitutes who lived and worked in the slums of the East End of London. Apparently, part of the Ripper's MO was to prey on women of the night.
 - In addition, no semen was discovered in any of these cases, which not only further links them but also suggests that rape was not part of the killer's MO.
 - The murders are also connected by increasing brutality, showing an escalation as time went on, a phenomenon seen in the careers of many criminals.

- Investigators look at these same factors today when they suspect that crimes may be linked—victim choice, weapon used, mutilation, and escalation. In a way, examining these factors—conducting forensic analysis—is similar to what our brains do every day in countless situations: compare data and recognize patterns.



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Investigators today look at many of the same factors that were examined at the time of the Ripper murders, including a killer's choice of victims and weapon.

Mary Ann Nichols and Annie Chapman

- The definitive Ripper victims (the “canonical five”) were all females whose poverty and thirst for alcohol apparently led them to prostitution. Their ages varied somewhat, but all were young to middle aged, and all were Caucasian.
- The first victim, Mary Ann Nichols, was discovered on August 31. She was found on her back with her skirts pulled up; her throat had been slashed deeply twice, and her low abdomen had been cut several times. A physician who examined her body at the scene at around 4:00 a.m. concluded that she had probably been dead for about 30 minutes.
- The body of the second victim, Annie Chapman, was found around 6:00 a.m. on September 8. She also had two extremely deep cuts to her throat, which a physician later said had been made from left to right. Chapman’s skirts had been raised, her belly had been cut

open, her intestines had been pulled outside the body, and her entire uterus had been removed and taken.

Elizabeth Stride and Catherine Eddowes

- Almost a month later, on September 30, the body of Elizabeth Stride was found at around 1:00 a.m. But this case was different; the victim had only one cut to her neck, her skirts were not raised, and her belly wasn't mutilated.
- Several witnesses claimed to have seen Stride in the area between 11:00 p.m. and 12:45 a.m. in the company of a man on the same night. As is often the case, few of the witnesses could agree on the appearance of the man they claimed to have seen.
- One eyewitness, however, said that he saw Stride at 12:45—in the same location where her body was found—in an altercation with a man. According to this witness, the man had dark hair and a thin moustache; was about 5 feet, 5 inches tall and broad-shouldered; and was around 30 years old.
 - The onlooker thought he was watching a domestic argument and didn't want to get involved. The discovery of Elizabeth's body at 1:00 a.m., just 15 minutes later, suggested that this witness—a Hungarian Jew—may have stumbled on the Ripper in the process of killing one of his victims.
 - The authorities took the account of this Hungarian quite seriously because he had come forward despite anti-Semitic tensions in the area. He saw what he described as an altercation, including the woman's low-pitched cry, before the attacker noticed the bystander, causing the Hungarian to rush off.
 - Investigators already believed that the Ripper's MO was to strangle or first slit his victim's throats, which would prevent them from screaming during the rest of the attack. Police theorized that the Hungarian may have stumbled on the attacker as he was just beginning to execute his typical MO on

Stride. Once the Ripper realized someone was watching, he ran off after only a single cut to the victim's neck.

- Within moments of the homicide's discovery, a crowd of nearly 30 people had gathered around Stride's body. An officer told them to stand back, not because they might contaminate the crime scene, but because if they got blood on their clothes, they might become suspects. In fact, officers examined the hands and clothes of onlookers for bloodstains, took down names and addresses, and even checked people's pockets before allowing anyone to leave.
- About 45 minutes after the discovery of Stride's remains, the body of Catherine Eddowes was found not too far away. Eddowes had been released from jail for being drunk and disorderly at about 1:00 a.m., and it seems that the Ripper chose her to complete his interrupted MO.
 - Eddowes had her throat slit twice, her skirts lifted, her belly cut open, and portions of her intestines removed and put on her shoulder. Most of her uterus had been cut out, and her left kidney was removed and taken as a trophy. Her face was also cut up, including one ear.
 - Investigators later found a piece of cloth smeared with blood and feces not too far from the crime scene. The cloth turned out to be part of Eddowes's apron that the killer had cut from her clothing and apparently used to clean his knife and, possibly, his hands.
- Another unusual aspect of the Eddowes case was a message written in chalk on the wall in the busy marketplace next to where the piece of apron had been discarded. It said, "The Juwes [sic] are the men that will not be blamed for nothing." The meaning of this message is still open to debate, but it echoed the anti-Semitism that divided the community with regard to the murders. Instead of photographing the message, the police decided to copy it down, then obliterate it.

- Because of the anatomical knowledge some ascribed to the mutilations and trophy removal and the allegations that the Ripper might be a Jew, some began to suspect that the killer was a Jewish slaughterhouse worker. Perhaps to satisfy the public, the police rounded up the knives of these workers to see if any matched the suspected weapon. A doctor concluded that none of them did.
- Nearly two weeks after the night Stride and Eddowes were killed, the chairman of the Whitechapel Vigilance Committee received a package containing half a kidney, preserved in wine and assumed to be human, along with a note explaining that the other half had been eaten by the killer. Using microscopic examination, two doctors independently concluded that the kidney was human, but they were unable to say whether it belonged to Eddowes.

Mary Jane Kelly

- The next Ripper victim, Mary Jane Kelly, was not killed until November 9, almost six weeks after the murders of Stride and Eddowes. Her body was found in her home around 10:45 a.m. by a man sent to collect overdue rent. He knocked, then peered through the window and was stunned to see Kelly's mutilated body on the bed.
- This time, the crime scene investigation seemed much more thought out, perhaps owing to criticism of previous police actions. A telegram was sent to Scotland Yard to bring bloodhounds, the area was cordoned off to the public, and a doctor was called to the scene. For some reason, the decision to use the dogs was reversed, and at 1:20 p.m., police broke down the locked door and began to examine the murder scene.
- Crime scene photos show Kelly's body was on the bed, nude, with her legs splayed open. Her face had been mutilated beyond recognition; her throat was cut to her spine; her abdomen was completely eviscerated; and her heart had been cut out and was never recovered.

- At the autopsy, the attending physicians estimated the time of Kelly's death at somewhere between 2:00 and 8:00 a.m. They believed it might have taken the Ripper perhaps two hours to do that much damage to the body.
- The murder of Mary Kelly apparently ended the killer's rampage—at least in the London Whitechapel area. No one knows to this day who he was or why the murders ended. Despite thousands of books written on the subject and countless articles espousing different theories and possible suspects over 125 years of analysis, the killer's identity is unknown.

The Role of the Media

- The reason this series of brutal murders became the best-known criminal matter of its time was the concurrent boom in newspaper circulation in the second half of the 19th century. Advances in printing and tax reform in England allowed unprecedented low-cost production and distribution. London was arguably the most prominent of capital cities in the world at the time and had dozens of newspapers, as well as a true crime magazine. This was the era when journalism was born.
- Thus, news of London's East End crime wave spread quickly after the discovery of Nichols's mutilated body. In fact, the infamous name of this still-unknown killer was actually delivered to the newspapers in the form a letter written in red ink to London's Central News Agency on September 27. The letter writer took credit for the prostitute killings and signed the message "Jack the Ripper."
- Then, as now, many who have delved into the Ripper murders believe that the letter and a later postcard were part of a hoax. Most attribute them to someone in the media—a journalist who had inside knowledge of the events and wanted to sell newspapers. And sell papers they did. In fact, Mary Jane Kelly's boyfriend told police that she regularly asked him to read her news of the killer

from the local papers. Neither could know that she would soon be front-page news as the Ripper's final victim.

Suggested Reading

Begg, *Jack the Ripper*.

Douglas and Olshaker, *The Anatomy of Motive*.

Federal Bureau of Investigation, *Serial Murder*.

Rumbelow, *The Complete Jack the Ripper*.

Sugden, *The Complete History of Jack the Ripper*.

Questions to Consider

1. How do you think the investigation of the Jack the Ripper case would be different (either positively or negatively) if those crimes happened today?
2. Do you think Jack the Ripper could have been a woman? Why or why not?

Analyzing the Black Dahlia Murder

Lecture 2

On January 15, 1947, in the Leimert Park area of Los Angeles, a mother out walking on an errand with her daughter saw what she thought were two pieces of a store mannequin laying in a vacant lot. She was shocked when she realized it was actually the nude body of a woman who had been cut in two at the waist. The victim had black hair, and her skin was porcelain white, even more so from a near complete lack of blood. Some said her hair color was the reason this woman came to be called the Black Dahlia. In this lecture, we'll compare her murder and the ensuing investigation to the earlier case of Jack the Ripper.

Lust Murder

- Although they're rare, murder-mutilation cases are considered by many forensic behavioral analysts to be among those crimes that most lend themselves to psychological profiling. A special crime category known as *lust murder* involves fantasizing about, and deriving erotic pleasure from, killing in an intimate way, sometimes during sex and not uncommonly followed by genital mutilation or evisceration of the victim.
- Other common features of these crimes are posing the body after death, consuming the blood or tissue of the victim, or keeping body parts as trophies. Frequently, the killer's actions escalate over time in a string of murders. Torturing the victims before death is typically part of the serial killer's sick fantasy; some also engage in necrophilia.
- Many psychologists believe that this type of *paraphilia*, or sexual deviance, relates to childhood trauma: The killings represent a way to retaliate against the person who harmed the perpetrator as a child. When the murders don't satisfy the killer's needs, they often lead to a vicious cycle of increasing violence.

- The vast majority of lust murderers are men, many of whom kill only women. Well-known cases include those of Ted Bundy, who murdered more than 30 women in the 1970s, and Gary Ridgway, the Green River Killer, who is estimated to have killed more than 90 women and girls in the 1980s and 1990s. Other serial lust killers prey on couples or males. Infrequently, couples commit lust murders together.
- Although there have been serial killers who are women, they typically don't fit the lust murder profile and are more likely to kill lovers or their own children or to become delusional "angels of mercy," killing feeble or disabled people. A notable exception is Aileen Wuornos, a woman who killed seven men in Florida between 1989 and 1990.

Examining the Crime Scene

- In both the Black Dahlia and most of the Ripper murders, onlookers, the press, and even the police themselves severely compromised crime scene evidence and its recovery. Such contamination used to be all too common at crime scene locations in populated areas or outdoors. Today, we have come a long way in our understanding of crime scene contamination and trace evidence.
- *Trace evidence* refers to tiny bits of material that might be found at a crime scene. This evidence directly translates to pieces of information—but only with the recognition that it's present, even if difficult or impossible to see with the naked eye. Valuable trace evidence can be unwittingly destroyed or removed from the scene, even by investigators.
- Another problem with overaggressive interest in a scene is the introduction of unrelated material, such as the hairs and clothing fibers that fall off observers. Such material complicates analysis and wastes time because it focuses attention on evidence that is unrelated to the victim or perpetrator.

- In the Black Dahlia case, the lead detective was a senior LAPD officer who had literally written the book on protecting crime scenes and preserving evidence, but significant damage had already been done. Journalists were walking around the area, snapping photos of the body and throwing cigarette butts and used flashbulbs on the ground.
 - The fact that there was no blood on the ground around the remains told the police that Dahlia's body had been brought to the site, rather than killed where it was discovered, as the Ripper's victims had been.
 - Also unlike the Ripper victims, the Black Dahlia had rope marks on her wrists, ankles, and neck, causing police to suspect she had been tortured before she was killed. The body appeared to be literally empty of blood, and the detectives wondered if ropes had been used to hang the victim like a meat carcass to drain her blood.
 - As in the Ripper killings, police thought the perpetrator might have some type of anatomical knowledge—perhaps from experience as a butcher, physician, or medical student.
 - By comparing the amount of dew in the grass around the victim versus the amount beneath her, investigators surmised that the body parts were deposited around 2:00 a.m. on the day the body was discovered.
 - Detectives believed that the perpetrator had carried the two body parts to the lot one at a time, suggesting a single killer. Debris on the upper half of the body indicated that it was originally face down but had been turned face up for display.
 - The lower half of the body had been carried on an empty cement bag, which was found nearby with traces of watered-down blood on it. Police also saw a heel print, but it had been damaged by tire tracks.

- Before the body parts were removed from the scene, detectives collected some trace evidence from them: tiny bits of a bristle-like material, which they thought could be broom straw or fibers from a car floor mat.

The Black Dahlia's Autopsy

- The autopsy revealed that the Dahlia's body had been drained of blood and washed clean. Like more than half of the Ripper victims, the Dahlia had been eviscerated; her intestines were found tucked underneath her body. Bruising of the face and right side of the head showed that she had been bludgeoned while still alive. Investigators suspected that she may have been tortured for days before her death. The cause of death was ruled to be blunt force trauma to the head and subsequent loss of blood.
- Although the body was further examined for trace evidence, none was found; there was no trace of semen or evidence of vaginal intercourse. However, the victim had been sodomized, and the medical examiner believed the penetration to have been postmortem.
- By measuring the lengths of both body segments, the woman's height was recorded as 5 feet, 5 inches tall, and together, the two body parts weighed 115 pounds. Her age was estimated to be between 15 and 30 years.
- Morgue photos were given to a police artist to generate a likeness of the victim for release to the media in the hopes of a quick identification. When the images appeared in the newspaper, calls started pouring in about possible missing persons, but none of them checked out.

Identifying the Victim

- The victim had been fingerprinted as soon as she was brought into the morgue at 2:45 p.m. so that the prints could be sent by special-delivery airmail to the FBI in Washington, DC. But snowstorms



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The Integrated Automated Fingerprint Identification System (IAFIS) allows digitized prints to be compared within a matter of seconds using computer technology.

were delaying plane flights, and estimates were that it could take as long as a week before the prints were actually delivered.

- Faced with this potential delay, the editor of the *Los Angeles Herald-Examiner* got the idea to send the prints using a Soundphoto machine, an early means of sending images over telegraph wires. The images arrived in Washington the next morning, but they were blurry and impossible to classify into the searchable fingerprint codes that were in common use in comparisons at the time.
- The photographers at the *Herald-Examiner* then enlarged the fingerprint images and resent them. The results were good enough to be confidently classified by FBI agents. Within minutes, the Black Dahlia was known to be 22-year-old Elizabeth Short, originally born in Massachusetts. Her prints were on file because

she had worked about four years earlier as a civilian employee at Camp Cooke army base in California.

- Short had moved to California when she was 19 years old, with hopes of becoming an actress or a model. She later worked at the army base and as a waitress. She moved around frequently and was always short of cash. A party girl, Short went out on dates almost every night, although there was never any evidence of prostitution.

Suspects in Dahlia's Case

- As they had in the Ripper killings, police immediately began to canvass the neighborhood to look for potential witnesses or possible suspects. Investigators interviewed Short's father, personnel at the army base, and a number of former boyfriends.
- The last person claiming to see Short alive was a 25-year-old married salesman named Robert Manley, who had met Short about a month before her death. Police held Manley as a suspect, but he passed a polygraph test and had a solid alibi for the night Short's body was dumped.
- Eight days after Short's body was found, a man phoned the editor of the *Herald-Examiner*, claiming to be the killer and saying that he would send the newspaper some of Short's belongings. The next day, a package arrived with several items, including photos, Short's birth certificate, and an address book with the name Mark Hansen embossed on it.
- Hansen was a nightclub owner who had befriended Short. He admitted the book was his, but clearly Elizabeth had been using it. He and all the others listed in the address book were questioned, with no results. In 1951, during a follow-up inquest, Hansen was still among the main suspects, but no charges were ever filed, and Hansen died in 1964.

Conclusions about Dahlia

- Strangely, Short's brutal murder appears to have been an isolated incident. No other similar cases in the Los Angeles area have been definitively linked to Short's death. Given the typical pattern of multiple killings, why or how could a lust murderer limit himself to a single killing?
- It seems unlikely that Short's killer continued to prey on women but became more careful about body disposal. Such a change doesn't fit with the killer's MO of dumping the body in a public place and posing the victim. The killer obviously wanted Short's body to be found and to shock the community.
- With Jack the Ripper, investigators theorized that the killings abruptly stopped because the murderer died, was incarcerated for another crime, or moved on. In the Dahlia case, it's possible that a serial offender operating somewhere else came to Los Angeles and committed this single horrible crime. Investigators looked at similar crimes elsewhere in the United States but found no links that seem likely today. As with the Ripper killings, we may never know whose lust and rage caused the terrible end of Elizabeth Short.

Suggested Reading

Douglas and Olshaker, *The Anatomy of Motive*.

Ellroy, *The Black Dahlia*.

Federal Bureau of Investigation, *Serial Murder*.

Gilmore, *Severed*.

Pietras, *Unanswered Evidence*.

Questions to Consider

1. Had you heard of the Black Dahlia killing before this course? If so, from what source?
2. How likely do you think it is that the Black Dahlia's death was the perpetrator's sole murderous act?
3. What types of evidence and other forensic leads do you think investigators use to link multiple crimes to each other?

Dissecting Hollywood Deaths

Lecture 3

Hollywood is a place filled with movies and stars, stories of success and failure, and unfortunately, in some cases, untimely and suspicious deaths. In this lecture, we'll examine several historical cases from Hollywood and see how scene investigation and autopsy are crucial in analyzing mysterious deaths. We'll first explore the case of George Reeves, one of three actors who played Superman—all of whom died under unusual circumstances. Then, we'll look at the cases of Hollywood bad boy Bob Crane and martial arts expert Bruce Lee. In all these Hollywood cases, we'll see that autopsy results were essential in trying to establish both cause and manner of death.

George Reeves

- George Reeves, the actor who played Superman beginning in 1952, was born George Brewer in a small Iowa town in January of 1914. As a teenager, he began boxing and competed in the 1932 Olympics. In 1939, renamed George Reeves by a studio, he played one of Scarlet O'Hara's admirers in *Gone with the Wind*.
- After serving in World War II, Reeves eventually landed in New York, the hub of the early television industry. When a show about Superman was planned, Reeves auditioned and won the leading role. Filming began in the summer of 1951; the first episode aired in September 1952, and the show was an instant success, running for six years.
- In the early 1950s, Reeves began a longstanding affair with Toni Mannix, a former Ziegfeld Follies girl and the wife of a successful MGM producer. Reeves and Mannix were often seen as a couple in public, and Mannix was said to be very possessive of Reeves.
- In 1958, Reeves met Leonore Lemmon, a well-known New York party girl. When Reeves took up with Lemmon, Mannix began to

harass him with daily phone calls. Although Reeves and Lemmon had a rocky relationship, they planned to marry in the summer of 1959.

- On the evening of June 16, 1959, three days before the wedding, a group of friends and neighbors gathered with Reeves and Lemmon at Reeves's home.
 - According to the guests, Reeves went upstairs to bed in a bad mood around midnight, only to come down later to complain about the noise the remaining party guests were making. Reeves had another drink before going back to bed.
 - About 2:00 a.m., the guests heard a single gunshot; one of the neighbors ran upstairs to find Reeves lying on his back, naked, with a 9-millimeter Luger pistol between his feet and a fatal gunshot wound to his right temple.
 - The houseguests didn't call police until 30 or 40 minutes after the shooting. Officers reported that the witnesses were all drunk and gave no excuse for the delay in calling.
- A single bullet casing was found beneath Reeves's body, which suggested that he was probably sitting on the edge of the bed when shot, then fell back onto the casing. The bullet that struck Reeves was recovered from the ceiling.
- Initially, Reeves received only a cursory autopsy at the funeral home before being embalmed. Later, a more thorough autopsy was done at the L.A. County morgue. Blood samples taken before the embalming revealed a blood-alcohol level of 0.27. Toxicology tests showed painkillers in Reeves's system that had been prescribed following a recent car accident.
- The fracture patterns in the skull were said to be consistent with a close shot. There was reportedly no gunpowder on Reeves's temple, but that's not uncommon in contact wounds. Because the gun had

been recently oiled, no clear fingerprints were found on it. The L.A. County coroner ruled Reeves's death a suicide.

- Helen Bessolo, Reeves's mother, wasn't satisfied with the ruling; she refused to have her son's body cremated and hired her own detective to investigate his death. In January of 1960, Reeves's body was sent to Cincinnati for a third autopsy, which again supported a finding of suicide. Reeves's mother finally agreed to cremate her son's body three years after his death and shortly before her own.
- During the investigation, rumors surfaced that Mannix had hired a hit man to kill Reeves. Another account, attributed to a neighbor present the night Reeves died, alleged that Lemmon instructed the other witnesses to tell police she was downstairs during the shooting, but she wasn't. Though suspicions may still exist, the official ruling of suicide in Reeves's death still stands.

Bob Crane

- The actor Bob Crane was best known for his starring role as Colonel Hogan on the sitcom *Hogan's Heroes*. The show ran from 1965 to 1971, after which Crane's career went downhill.
- Crane had a reputation as a bad boy, stemming from his insatiable sexual appetite. He constantly picked up women and often enjoyed group sex. Crane and a friend, John Carpenter, recorded Crane's sexual exploits using home video equipment, often without the knowledge of the other participants. Crane also had an extensive photo album of his many partners.
- The jealous boyfriends or husbands of the women involved with Crane sometimes caused him major problems. Crane's wife, Patricia Olson Crane, wasn't amused either. She and her husband were in the process of a divorce in 1978, when Crane met his death in Scottsdale, Arizona.
- On the night he was last seen alive, Crane appeared in a play at a Scottsdale dinner theater. Later that night, he went to a bar with

two women and John Carpenter. At about 2:00 am, the four went into a coffee shop; Carpenter left about a half-hour later, before the other three.

- Around 2:00 the next afternoon, Crane's body was discovered in his apartment by his co-star in the play, Victoria Berry. Crane was lying in the fetal position on his side with an electric cord wrapped around his neck. Blood was splattered on the adjacent wall.
- Investigators determined that the scene showed no signs of Crane struggling during his death. Smears on the sheets looked like someone had wiped blood on them—possibly while cleaning off the murder weapon. The only thing known to be missing from the apartment was the photo album of Crane's sexual conquests.
- At around 3:15, while Berry was giving her statement to the police in Crane's apartment, John Carpenter called. The police lieutenant who spoke with Carpenter told him that police were investigating an "incident" in Crane's apartment. Carpenter never asked the lieutenant where Crane was or what the investigation was about.
- An autopsy concluded that Crane was likely sleeping on his right side when the killer delivered two blows to the left side of his head with a heavy object. The time of death was estimated between 3:00 and 3:30 a.m. The electric cord had been wrapped around Crane's neck after his death. The medical examiner speculated that the killer was probably a strong man, based on the blood spatter pattern analysis.
- Carpenter came under suspicion, and police brought the rental car he had used during his visit to Scottsdale in for analysis. On the inside of the passenger door, a small amount of blood was found; it was determined to be type B, the same as Crane's, but the match wasn't enough evidence for an arrest.
- However, in 1992, Carpenter was arrested for Crane's death based on a reexamination of photos of the rental vehicle that showed a

fragment of what could have been human tissue. The defense argued that something that small could not be adequately identified from a photo, and Carpenter was acquitted. Still, he lived under a cloud of suspicion until his death in 1998.

Bruce Lee

- Bruce Lee was born Li Jun Fan in San Francisco's Chinatown but grew up in Hong Kong. At age 13, he started formal martial arts training. He later began a career as a martial arts hero in Asian films. By 1971, he finally earned recognition in Hollywood.
- Lee was young, apparently healthy, and in top physical shape, but while working on the film *Enter the Dragon* in May of 1973, he collapsed into a seizure. He was taken to the hospital and diagnosed with cerebral edema—swelling of the brain due to excess accumulation of fluid. Lee told his doctor that he had used hashish from Nepal the day before and wondered if there was a connection. Lee's doctor warned him against using the drug.
- Lee recovered, and *Enter the Dragon* was successfully completed. Plans immediately began for his next film, *Game of Death*. Lee was to co-star with actress Betty Ting Pei, with whom some alleged he was having an affair.
- On the afternoon of July 20, 1973, Lee and director Raymond Chow went to Pei's home to review the new script. At some point after the director left, Lee told Pei he had a headache, and she gave him a prescription painkiller called Equagesic. Later that evening, when Lee couldn't be awakened from a nap, an ambulance was called, and he was taken to the hospital, where he was pronounced dead.
- An autopsy showed no signs of injury and no blocked or broken blood vessels, but Lee's brain had swelled some 13 percent. Toxicology showed cannabinoids in Lee's blood, in addition to the Equagesic Pei had given him.



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Scene investigation and autopsy are crucial in analyzing mysterious deaths.

- A dispute immediately arose among the physicians involved about whether the Equagesic or cannabis had caused Lee's death. In the end, authorities called Lee's case "death by misadventure," which is neither a recognized cause nor manner of death.
- In 2006, a Chicago pathologist asserted a different cause of death: *sudden unexpected death in epilepsy* (SUDEP). Statistics indicate that SUDEP deaths are more common in young adult males, and although Lee had not been diagnosed with epilepsy, he did have a previous seizure, observed at the time of his first episode of cerebral edema.

History of Death Investigation

- In all these Hollywood cases, autopsy results were essential in trying to establish both cause and manner of death. Assessing suicidal, homicidal, accidental, and natural deaths requires a

thorough examination of tissues, body fluids, potential weapons, scene clues, and witness testimony, when possible.

- But these methods are nothing new in forensics, especially in death investigations involving famous people. For instance, in 44 B.C.E., Julius Caesar's physician examined the 23 stab wounds on the emperor's body and deduced that only one of them—a specific knife wound to his chest—was actually fatal.
- Early pioneers in the field of forensics couldn't even imagine today's computerized chemical analyzers or scanning electron microscopes. And even familiar evidence, such as blood, carries much more power now than it did even just a few decades ago. We don't know where the future of forensic science will lead us, but it's easy to see how current technology would have aided justice in the past and avoided the mystery surrounding some well-publicized deaths.

Suggested Reading

DiMaio and Dana, *Handbook of Forensic Pathology*.

Di Mambro, *True Hollywood Noir*.

Graysmith, *The Murder of Bob Crane*.

Henderson, *Speeding Bullet*.

Lee, *Life and Tragic Death of Bruce Lee*.

Murray, *Death*.

Parish, *The Hollywood Book of Death*.

Pietras, *Unanswered Evidence*.

Schroeder and Fogg, *Beverly Hills Confidential*.

Spitz and Spitz, *Spitz and Fisher's Medicolegal Investigation of Death*.

Questions to Consider

1. Do you believe George Reeves's death was a suicide? Why or why not?
2. Who do you think killed Bob Crane? Why?
3. Can you name other suspicious Hollywood deaths that made headline news?

Decomposition and Confusing Interpretations

Lecture 4

In July 1933, 7-year-old Dalbert Aposhian and his 9-year-old friend Jackie Confar were playing near downtown San Diego, where both of their parents worked. Later that day, when something terrible happened, Jackie panicked and ran home alone, afraid to tell his parents what he'd seen. Dalbert's body was found six days later, floating in San Diego Bay. The coroner determined that Dalbert had been murdered, but no killer was ever found, and a later examination disputed the original findings. Fortunately, most records and images related to the case were maintained, enabling insights from new research and technology to be applied more than 70 years later.

The Disappearance of Dalbert Aposhian

- Dalbert Aposhian's parents—a Protestant minister and his wife—were worried when their son did not return home one evening in July 1933. They reported the boy's disappearance to authorities. Police questioned Dalbert's friend Jackie Confar, who nervously reported that the pair had been playing together early in the day but that he had later left Dalbert at a local store.
- Six days later, four sailors found Dalbert's body floating in the waters of San Diego Bay. Dr. Frank Toomey of the San Diego Coroner's Office released the results of the boy's autopsy: Dalbert had been sodomized, murdered, and mutilated. Toomey said that no water was found in the lungs, which meant that the boy could not have drowned but was dumped in the bay. He also reported traces of semen in the boy's distended rectum.
- The press ran with the story, and the community was up in arms, insisting that police find the vicious killer before he struck again. Reporters—not the police—identified Dalbert as the sixth victim in a string of crimes they were trying to link to a suspected sexual predator believed to be operating in the San Diego area. There was at least one false confession.

- In the midst of all the publicity, police questioned Jackie again, but now, the boy changed his story. He told them that the boys had sneaked onto the San Diego pier to try to fish, but Dalbert slipped and fell into the water. Jackie said he had been too afraid to tell anyone what really happened because the boys had gone beyond their designated play area. Some of the investigators believed this version of the story, but Toomey stuck by his autopsy findings.
- Two years later, when the crime was still unsolved, a Los Angeles pathologist performed a second autopsy on Dalbert's body. This pathologist disputed the original findings and believed the cause of death to be drowning.
- More than 70 years later, the San Diego Police Department received a grant to open cold cases using DNA technology. Although there was no DNA left from the Aposhian case, the San Diego medical examiner, Dr. Jonathan Lucas, read the conflicting autopsy reports and examined numerous photos.
 - Lucas determined the death to be the result of drowning and the mutilation of the boy's body to have been caused by marine life. He also noted that it was highly unlikely that sperm could survive in open water for six days; no one knows why the original autopsy report concluded that there was semen in the rectum.
 - As a result of this reexamination, Dalbert Aposhian's case was officially closed as an accidental death in December 2005.

Studying Decomposition

- The San Diego Medical Examiner's Office claims that it never discards anything from open homicide cases, which means that new research and technology can be applied to old cases, sometimes resulting in fresh conclusions.
- For instance, through modern studies, we now know much more about the decomposition process and the effects of animal activity than was understood or documented at the time of Dalbert's

death. That knowledge is what allowed Dr. Lucas to reach a new conclusion.

- Surprisingly, even in the 1930s, it wasn't completely unheard of to use experimentation to assess what might have happened in a forensic case. At the time of the second autopsy, two years after Dalbert's death, investigators conducted an experiment using rabbits to attempt to show that sperm could not survive in water, as Toomey had first reported. Their results documented the unlikelihood of finding semen after six days, but apparently, no one paid attention to this conclusion.
- Since that time, there has been much groundbreaking—and sometimes controversial—research into the science known as *taphonomy*, that is, the study of what happens to living organisms once they die and are deposited in the environment. This field studies everything from the effects of marine life to those of climate variables on bodies.
 - The Anthropology Research Facility at the University of Tennessee (known as the Body Farm), which started in the 1970s, was the prototype for formal taphonomic studies on humans, but today, several research facilities devoted to human decomposition now exist around the United States.
 - Donated bodies are subjected to a number of



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Conducting experiments and documenting the results are the cornerstones of scientific understanding, and today's forensic community takes its role in that process seriously.

settings in different parts of the country to enable new insights into the science of decay. In addition, many experiments use pig models to study decomposition because pigs have relatively hairless skin, like humans.

- Taphonomic studies often seem disturbing to members of the general public, but this kind of research can help demonstrate that initial appearances may be deceiving. For example, studies have shown that insect activity can have effects not only on carcasses but also on associated artifacts, such as clothing.

Case Study: A Modern-Day Mummification

- Two women—a mother, Susan, in her 80s and a daughter, Ann, in her 60s—lived together in an apartment in a rundown area near downtown Cincinnati. The landlord spoke with Ann when she brought the monthly rent check, but he never saw Susan. Over time, the landlord became suspicious and finally told Ann that he would accept her next rent check only if her mother delivered it in person.
- The next month, Ann pretended to be her mother and walked into the landlord's office with the rent check. The man accepted the payment, but as soon as Ann left, he called the police and told them his suspicions.
- Officers went to the apartment where the pair lived to question Ann and ask if they could conduct a search. The apartment was horrendously filthy, suggesting a hoarding situation, but there were no signs of foul play. Ann told the officers that her mother was visiting relatives in Detroit.
- Back at the police station, officers contacted family members in Detroit, who said they hadn't seen Susan for four years. Investigators returned to the apartment that same afternoon and noted that everything was exactly as it had been that morning with one exception: A large, freestanding metal cabinet that had been in the kitchen was now thrown over a ravine in the backyard. The

officers transported the cabinet and the cloth-covered bundle inside it to the coroner's office.

- The officers asked Ann if the cabinet contained the remains of her mother, and she admitted that it did.
 - Ann said that Susan had fallen down the stairs and was badly hurt. She claimed that she had helped her mother into bed and attempted to nurse her back to health but with no success. Eventually, Ann bathed her mother's body with bleach, wrapped the body in bedclothes, and stored it in the cabinet.
 - When police asked why Ann hadn't reported the death or buried her mother, the woman said that they were descendants of the Blackfoot tribe, and burial was not their custom.
- The first step in the examination at the morgue—even before unwrapping the remains—was to X-ray the bundle. The X-rays revealed a number of small, round metallic objects scattered through the chest and neck area, with some embedded in the victim's skull—possibly buckshot or birdshot.
- The next step was to unwrap the remains and perform an examination, with two main objectives in mind: The pathologist's job was to try to establish the cause or manner of death, while the role of the anthropologist was to look at any anatomical features that might help scientifically establish the person's identity.
- Removing the bedclothes revealed a mummified corpse. All the soft tissues were completely desiccated. The wrapping, combined with the relatively constant environment inside the cabinet—and, perhaps, something about the bleach—had caused a modern-day case of mummification. Such atypical decomposition is generally a product of circumstances in which the temperature is relatively constant and insects and other organisms have limited access to the remains.
- Both the skeletal features and external anatomy suggested that the body was that of a woman. The jaws lacked teeth, a finding

consistent with the identity of Susan. There seemed to be no entrance or exit wounds on the surface of the body. The metallic pellets embedded in the skull were found to have an unusual consistency, almost like putty and unlike birdshot made of lead or other compounds.

- When the police asked Ann whether her mother had been shot, she replied that Susan had—back in 1926 in Bullitt County, Kentucky, in connection with a feud among neighbors over the illegal distilling of alcohol. Investigators confirmed Ann’s story through a 1926 newspaper account of a shooting involving Susan’s family and their neighbors.
- The authorities decided not to charge Ann with desecration of a corpse because she didn’t seem to be of sound mind in many ways. But she was charged with Social Security fraud because she had been cashing her mother’s government checks for the four years she had hidden the body.

Case Study: Deceiving Appearances

- A couple came home from vacation to find a hole of about a foot in diameter in the middle of the deck in their backyard. The homeowners called the local authorities, originally thinking that perhaps a meteorite had crashed through the deck.
- Investigators found that the object that had made the hole appeared not to be a solid mass but a plastic bag. As a result of the impact, the bag had broken open, and around it, a powdery substance was slightly scattered under the deck. Clearly, the bag had to have fallen from a great height to cause such damage to the deck.
- A physical anthropologist later determined that the bag was filled with human cremated remains and had been dropped from a small airplane. The remains were supposed to be scattered to the wind during flight, but the bag had been accidentally let go before it was opened.

- The police eventually tracked down the family involved, who recovered the ashes of their loved one and had a second chance to scatter them to the wind.

Suggested Reading

Bass and Jefferson, *Death's Acre*.

Murray, *Death*.

———, *Forensic Identification*.

Rathbun and Buikstra, *Human Identification*.

Spitz and Spitz, *Spitz and Fisher's Medicolegal Investigation of Death*.

Steadman, *Hard Evidence*.

Questions to Consider

1. What types of evidence are used to estimate time since death?
2. What are some of the causes and variables of the decomposition process?
3. What is your opinion of the use of human cadavers in decomposition studies throughout the United States and elsewhere?

Lizzie Borden and the Menendez Brothers

Lecture 5

Some sources say that a newspaper peddler created the famous “Lizzie Borden took an axe” rhyme to try to generate sales, but no one really knows for sure. Still, this case from the late 1800s is a good example of how a relatively unknown person can become infamous—and plead not guilty at trial—despite a mountain of evidence. In this lecture, we’ll look at the Lizzie Borden case in detail, as well as a more modern-day family feud—the case of Lyle and Erik Menendez. The two cases—more than 100 years apart—share some striking similarities.

Background on the Bordens

- Lizzie Borden was born on July 19, 1860, in Fall River, Massachusetts, to Andrew Borden and Sarah Morse Borden. She had a sister, Emma, who was about 10 years older. When Lizzie was just 2, her mother died, and in 1865, her father remarried a woman named Abby Durfee Gray, who was already well into her 30s.
- Andrew was a successful entrepreneur, bank president, and landlord. He was admired for his business sense but not very well liked, though he was said to treat his wife and daughters well. Despite his wealth, Borden was known to be tight with money.
- Both Lizzie and Emma were well-respected spinsters, and despite not getting along with their stepmother, they both still lived at home. Lizzie was a Sunday school teacher and was involved in the women’s temperance movement. She was said to envy her richer relations and friends.
- A burglary took place in broad daylight at the Borden house in 1891, when only the two sisters and their live-in maid, Bridget Sullivan, were at home. The only things taken were about \$50 and some jewelry. The police were called, but a couple of weeks after the incident, for unknown reasons, Mr. Borden asked to have the

investigation stopped. The family may have suspected Lizzie as the burglar.

- Lizzie didn't have much of a social life outside of church, but she was an animal lover and kept pigeons in the loft of the family's barn. Sometime in May or June of 1892, Mr. Borden got upset by Lizzie's hobby, saying that it drew neighborhood boys who were shooting at the birds. He beheaded Lizzie's pigeons with an axe. Things became so tense in the household that by July, Emma and Lizzie went on a week's vacation to New Bedford.

The Murders

- In early August of 1892, Mrs. Borden went across street to visit a neighbor, Dr. Seabury Bowen, saying that the family and their maid had been sick for several days. Mrs. Borden feared that they might have been poisoned, but the doctor believed it was probably something they'd eaten. Lizzie told her friend Alice Russell that she thought someone—perhaps an enemy of her father—had poisoned their milk; Lizzie claimed to have seen a strange man hanging around the house and barn.
- The next day was August 4, 1892, and while Emma was away at a friend's house party, 32-year-old Lizzie screamed for Bridget to get the doctor, saying that her father had been killed. Although there was no sign of a struggle, Mr. Borden's body lay on the sofa in the family's sitting room; his face had been smashed in by a sharp weapon. A short time later, Mrs. Borden was found dead upstairs.
- Autopsies were conducted at the Borden home at 3:00 that afternoon. Based on the victims' body temperatures and the condition of the blood at the scene, the doctor thought that Mrs. Borden had been killed between 9:00 and 9:30 a.m. Mr. Borden's face had been struck with a large, sharp implement—possibly an axe—from someone probably standing above and behind him. Many blows had crushed the back of Mrs. Borden's skull.

The Investigation

- Lizzie and Bridget had been the only ones home at the time of the murders, and the two were questioned for most of the day. Their stories didn't exactly agree, but a composite timeline could be constructed.
 - Mr. Borden had left the house earlier and returned about 10:45 a.m. He asked Lizzie where his wife was, and she replied that her stepmother had gone to visit a sick friend. At about 10:55, Mr. Borden told Bridget that he was going to rest in the sitting room, and the maid went up to her attic room, as well.
 - Lizzie said that she had gone out to the barn and returned to the house around 11:10. She saw her father's bloody body on the couch and called for Bridget to go to Dr. Bowen's house. He arrived at 11:30. The police were called at 11:15 and arrived by 11:45.
- A search of the Borden property is said to have turned up two axes. Also found was a claw-hammer hatchet, a regular hatchet, and the head of a standard hatchet with its handle broken off. No bloody clothing was found at the scene, except the clothes on the victims.
- The funeral was held two days after the Borden's deaths, but investigators delayed the burial because they wanted a more thorough autopsy. The heads of the couple were removed and defleshed, just as they would be in an examination today. The medical examiner, Dr. Dolan, estimated that Mr. Borden's face had been struck 10 times with a hatchet (smaller than an axe), while Mrs. Borden's skull had sustained about 18 blows.
- On August 7, three days after the murders, Lizzie's friend Alice Russell saw Lizzie burning a blue dress in the kitchen stove. Lizzie claimed that the dress had a paint stain on it. Two days later, a judge held a closed inquest and ordered Lizzie, Bridget, and a few others to answer questions. Bridget told the magistrate that Lizzie had been wearing a blue dress on the morning of the murders, but she was wearing something else when police arrived.

- During her four-hour interview, Lizzie's story seemed suspect on a number of counts, and she was arrested two days after the inquest. At her arraignment hearing, she was charged with the double murder, to which she pled not guilty. At a grand jury hearing in November, it looked as if Lizzie might not be indicted until Alice Russell testified about the dress burning. Lizzie was jailed from arrest to trial, which took place in June of 1893 in New Bedford.

The Trial

- Lizzie had some support from members of her church, as well as an excellent defense team. The defense managed to have Lizzie's statements at the initial inquest ruled inadmissible because her lawyer had not been present. Further, the defense convinced the panel of three judges to exclude the testimony of witnesses that Lizzie had attempted to buy prussic acid (hydrogen cyanide) at a pharmacy the day before the murders.
- The prosecution emphasized motive—the inheritance Lizzie would receive, combined with her hatred of her stepmother—and opportunity. There were no prime suspects other than Lizzie, but the bulk of the prosecution's case was built on circumstantial evidence. No physical evidence could definitely be tied to Lizzie.
- After 10 days, the prosecution rested, and the defense spent only a day presenting its case. Emma testified that her sister and stepmother had a fairly cordial relationship and that Emma herself had been the one to tell Lizzie to burn the blue dress that was stained with paint. The defense also tried to poke holes in the prosecution's timeline and introduced witnesses who said they had seen strangers in the area on the day of the murders.
- The jury quickly found Lizzie Borden not guilty of killing her parents. Lizzie was released and returned to Fall River, where she lived for the rest of her life. She and Emma sold the family house and moved to a mansion. Emma later left town, changed her name, and stopped all contact with her sister. Lizzie died in 1927 at age 67; both she and Emma are buried next to their parents.

The Menendez Brothers

- The idea for killing their parents came to the Menendez brothers while they watched a movie in which a group of wealthy Los Angeles hipsters commits murder. Following the movie, 21-year-old Lyle and 18-year-old Erik discussed their overbearing father, who had pressured them to achieve and had cheated on their mother. The brothers decided that if they murdered their father, they would also have to kill their mother; not only would she be a potential witness, but she couldn't live without her husband.
- On August 20, 1989, José and Kitty Menendez were watching television in the den of their 23-room mansion. Apparently, their sons made sure that the security system was off as they entered the house, each with a shotgun.
 - According to the autopsy results, the boys most likely fired one round into José from the front, then walked behind him and fired again.
 - Kitty must have jumped up with the first shot to her husband and, as she tried to get away, was shot 9 or 10 times. The boys ran out of ammunition before realizing that Kitty was still alive, and one of them went back to the car to reload.
 - The brothers also shot both parents in the kneecaps in an attempt to make the murder look like an organized crime hit, a theory they later proposed to the police. They then picked up the shell casings and called the police.
- Lyle and Erik were not immediately suspects, but within six months after their parents' murders, the brothers had spent about \$1 million, and police interviewed them again. A break in the case came when police were tipped off about audiotapes recorded by Erik's therapist, Dr. Jerry Oziel, in which the young man confessed to killing his parents. The Menendez brothers were arrested in March of 1990.



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Doctor/patient communications are usually considered privileged and are not admissible in court, but confidentiality does not apply if a patient threatens the doctor.

- It took three years before a trial began. During that time, the judge ruled some of the audio recordings admissible but not the one in which Erik described the crime in detail. The brothers pled not guilty, claiming that the act of killing their abusive parents had been a form of self-defense. Prosecutors pointed to the massive amount of money the Menendez brothers had spent after killing their parents and to their elaborate plan for the murders.
- Although there was a single trial, there were two juries, one to hear the case against Erik and another to try Lyle, but neither jury was able to reach a conclusion. The district attorney requested another trial, which was granted. The result was two guilty verdicts and life in prison for the brothers, without the possibility of parole.

Suggested Reading

Brown, *Lizzie Borden*.

Davis, *Bad Blood*.

Douglas and Olshaker, *The Anatomy of Motive*.

Pietras, *Unanswered Evidence*.

Porter, *The Fall River Tragedy*.

Schroeder and Fogg, *Beverly Hills Confidential*.

Soble and Johnson, *Blood Brothers*.

Spiering, *Lizzie*.

Questions to Consider

1. Do you think Lizzie did it? What is the evidence you would give for or against that opinion?
2. Women have married each of the Menendez brothers while they serve life in prison without parole (and are not allowed conjugal visits). What are your thoughts on the motivations of those involved?
3. Reportedly, the Menendez brothers have not spoken in a decade or more. What do you think may be behind their separation? Does their estrangement potentially tell us anything about the case?

The Tylenol Murders

Lecture 6

On September 29, 1982, in a Chicago suburb, 12-year-old Mary Kellerman woke and complained to her parents that she was coming down with a cold. They gave her some Extra Strength Tylenol. Shortly afterward, they found Mary on the bathroom floor and rushed her to the hospital. She was dead just a little while later. Some of you might clearly remember the media attention in this terrible case. The Tylenol poisoning was on the national news, and panic quickly spread. In this lecture, we'll look at the mobilization of forensic scientists and the Illinois Department of Health for this unprecedented case of product tampering.

Untimely Deaths

- When 12-year-old Mary Kellerman died in a Chicago hospital on September 29, 1982, after her parents found her on the bathroom floor, doctors suspected that she might have had a stroke, but that's rare in someone so young.
- One the same day as Mary's death, in another Chicago suburb, paramedics were called to the home of Adam Janus, a 27-year-old postal worker. Janus, found unconscious, was rushed to the hospital but died soon after of a suspected heart attack. That evening, two of Janus's family members also collapsed, and both died shortly thereafter. Forensic investigators suspected poisoning, and blood samples were taken from all three for toxicology.
- When someone dies unexpectedly, forensic investigators routinely examine the scene and question witnesses, family members, or coworkers. To help pathologists establish cause and manner of death, these investigators try to find links among circumstances, events, and materials surrounding the loss of life.
 - When these Chicago-area investigations led to the discovery that Mary Kellerman and all three of the Janus family members had

taken Extra Strength Tylenol before their deaths, police rushed back to the scenes and confiscated the bottles of acetaminophen.

- Forensic chemistry indicated that several of the remaining capsules were tainted with high levels of potassium cyanide—thousands of times the lethal amount.

Response to the Crisis

- Johnson & Johnson, the maker of Tylenol, was alerted and issued an extensive product recall. But in the meantime, three more women in the Chicago area had also taken the drug and were dead. The lot numbers on the tainted bottles indicated that they hadn't all come from the same manufacturing plant, which meant that Johnson & Johnson probably wasn't the source of the poison, either through accident or sabotage.
- Chicago police cars took to the streets, using loudspeakers to warn the public not to take Tylenol. Johnson & Johnson offered a \$100,000 reward for information leading to the capture of those involved. Investigators removed the product from store shelves all around the nation for forensic testing.
- Only eight adulterated packages of Tylenol were ultimately recovered, but many more may have been thrown away by consumers after hearing about the recall. A combination of store receipts and surveillance videos helped investigators determine that the eight bottles of tainted medication came from seven different locations.
- No usable fingerprints were recovered from any of the packaging or its contents. Investigators believed that someone was taking Extra Strength Tylenol bottles from stores—either stealing or buying them—opening the gel caps, adding cyanide, then returning the products to store shelves to be purchased by unsuspecting victims.
- Illinois Department of Health officials used a rapid test involving a small slip of chemically treated paper that could be put into a bottle and would turn blue if cyanide was present. These types of

quick assays are called *field tests* or *screening tests* because they allow rapid presumptive identification. If a substance tests positive, it's then subjected to *confirmatory tests*, which involve more sophisticated chemical analysis and high-tech lab equipment.

The Search for Suspects

- Because potassium cyanide is used in some industrial settings and in the mining industry, investigators looked for leads in those directions. They also considered people who might have been disgruntled with Johnson & Johnson.
- The first major suspect was a do-it-yourself chemist named Roger Arnold. He worked on the loading dock at one of the stores involved and had a weak connection to another store where tainted capsules were found. The father of one of the victims was also a coworker of Arnold. He was ultimately cleared of suspicion but was later convicted of the murder of man he thought had steered the police to him.
- The investigation turned to a more promising suspect after Johnson & Johnson received an anonymous letter with a New York postmark.
 - The handwritten letter—although not technically claiming to be from the killer—described how perfectly the poisoning had gone and how simple it had been to put the cyanide into the gel caps. The



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A letter sent to Johnson & Johnson bragged that putting cyanide in the Tylenol gel caps had required less than 10 minutes per bottle and cost less than \$50.

letter instructed Johnson & Johnson executives to deposit \$1 million to a specific account at the Continental Illinois Bank in Chicago if they wanted the deaths and the bad press to stop.

- The bank account listed in the letter was closed but had previously belonged to Frederick Miller McCahey, one of the heirs to the Miller Brewing Company. McCahey had run a Chicago travel agency that had recently gone bankrupt. But why would someone put his own bank account number in an extortion letter?
- What investigators didn't yet know was that one of McCahey's former employees, Leann Lewis, and her husband, James Lewis, were furious with him. They had even tried to sue McCahey in the summer of 1982—just months before the Tylenol poisonings—because one of Leann's paychecks had bounced.

Background on the Lewises

- James Lewis was in his mid-30s in 1982. His history included a difficult upbringing and a diagnosis of schizophrenia. In his late teenage years, Lewis allegedly chased his adoptive mother with an axe and beat up her husband before trying to kill himself with an overdose of over-the-counter pain reliever. He recovered at a mental health facility and later that claimed the attacks and suicide attempt had been a ploy to evade the draft.
- After his release, James met and married Leann, and soon after, the two had a baby, who had Down syndrome. The couple opened their own accounting and tax service in Kansas City so that they could keep their daughter with them at work. One day, a retired bachelor named Raymond West stopped into the storefront; he befriended the family and became one of the Lewises' tax clients.
- Some three and a half years later, in the summer of 1978, Raymond West disappeared. A friend who was suspicious contacted police,

and after about three weeks, West's dismembered body was found hidden in his own home.

- James Lewis was linked to this gruesome discovery through a number of avenues, including a check from West's bank account made out to Lewis for \$5,000 and dated on the last day West had been seen alive. After a search of Lewis's car yielded additional evidence, he was charged with murder. Unfortunately, the charges were later dismissed as a result of several legal missteps.
- Although Lewis was free, police continued to investigate his tax business and other ventures. By the end of 1981, authorities had amassed enough evidence to get a search warrant for the Lewises' home, but James and Leann went on the run. They moved to Chicago and assumed the names Robert and Nancy Richardson; Leann went to work for Frederick Miller McCahey's doomed travel agency.

Search and Arrest

- When the travel agency went bankrupt, James Lewis tried to mobilize the former employees to take action with the Illinois Department of Labor. He also had Leann contact one of her former supervisors to get a list of McCahey's bank account numbers, possibly to find out if he had any remaining money. When the claim ultimately went nowhere, James and Leann bought one-way train tickets to New York and left on September 4, 1982.
- Regarding the investigation of the killings and the extortion, authorities hadn't yet connected James and Leann to anything. When questioned, McCahey quickly identified James and Leann as people who might hold a grudge against him, but no one knew where they had gone.
 - Investigators initially thought that the extortion letter was just a hoax to embarrass McCahey, but they reconsidered after they learned of James's connection to the Raymond West case and the suspected business and tax fraud.

- By this time, the couple's faces and aliases had been highly publicized; Leann quit the job she'd just gotten in New York, and the two dropped out of sight.
- James then sent to the press a package of material related to the travel agency payroll default, indicating that there was good reason for framing McCahey but stating that he and his wife had not committed the Tylenol murders. In another letter, Lewis mocked police for reopening the Raymond West case. He began signing his real name and even put his right thumbprint on one letter.
- About two months after the Tylenol killings, a Manhattan Western Union surveillance camera captured Leann picking up a money order sent by her father. The big break came when the FBI received a call from a librarian who said that she believed James Lewis was sitting right then in the New York Public Library. Agents closed in and arrested Lewis, but they had enough evidence only to charge him with extortion.
- Leann turned herself in but refused to turn against her husband. About a year after the Tylenol killings, James Lewis was convicted of attempted extortion. He was sentenced to 10 years in prison, to be served consecutively with another 10-year sentence for other charges. Lewis was released in 1995 and has lived in the Boston area.

Continuing Investigation

- In 2009, the FBI searched the Lewises' home as part of an "ongoing investigation," citing the possibility of new evidence and technological advances that might help solve the Tylenol killings. This may have been a reference to *touch DNA testing*, a technique in which only a small number of human skin cells can be used to create a DNA profile. No new charges have been filed.
- In 2012, the year that marked the 30th anniversary of the Tylenol murders, media reports indicated that a grand jury might be convened to indict James Lewis in the seven murders, but that never occurred. Even lead investigators on the case disagree about

whether or not Lewis is actually responsible for the killings. Today, some describe the case as one of the earliest examples of what we would now call domestic terrorism.

- In the fall of 2013, the FBI announced that it could no longer serve as lead investigator in the killings. Still, Chicago-area police have not given up; several agencies have started a new task force to continue to pursue the Tylenol killer.

Suggested Reading

Bartz, *TYMURS*, books 1 and 2.

Blum, *The Poisoner's Handbook*.

Douglas and Olshaker, *The Anatomy of Motive*.

Emsley, *Molecules of Murder*.

Questions to Consider

1. Do you remember the news reports of the Tylenol murders when they occurred? If so, how did they make you feel?
2. Do you think James Lewis is responsible for the poisonings? Why or why not, based on the evidence presented in this lecture?
3. Can you think of other crimes that have prompted specific changes in the way we do things in society?

Copycats and Hoaxes

Lecture 7

The Tylenol murders of 1982 gave rise to changes in product packaging, federal anti-tampering laws, increased in-store surveillance, and new insurance protections for manufacturers. They also prompted a rash of copycat attacks and related hoaxes. Within four weeks of the last death in the Tylenol series, 270 cases of suspected product tampering were reported to the U.S. Food and Drug Administration (FDA). Some of the incidents were thought to be a form of mass hysteria, but the FDA was able to substantiate that in 36 of the cases, a product had been altered. In this lecture, we'll explore a number of other famous copycats and hoaxes.

Stella Nickell

- In 1986, a copycat named Stella Nickell of the Seattle area used the Tylenol case as inspiration to kill her husband, Bruce. First, she bought life insurance on him, then decided to commit additional tamperings to disguise him as her intended target. Nickell put cyanide into packages of Extra Strength Excedrin and Anacin-3; as a result, not only did her husband die, but six days later, so did Susan Snow. In Snow's death, the cyanide was discovered at autopsy and linked to the product found at her home.
- Amazingly, Nickell herself came forward to claim that her husband—whose cause of death had been ruled as emphysema—had taken Excedrin of the same lot number publicized by the media after Snow's death. Bruce Nickell had already been buried, but the hospital still had a sample of his blood, and tests found cyanide in it.
- Stella Nickell, along with Snow's husband, instigated wrongful death lawsuits against Bristol-Meyers, the company that manufactured Excedrin. An FBI investigation found cyanide in the two packages Nickell turned in, the bottle from Snow's home, and two other tainted packages on store shelves.

- In those five packages, investigators also found green flecks that they determined were from an algacide commonly used in fish tanks. Agents knew from a visit to her home that Nickell had an aquarium. They canvassed local pet stores and found a clerk who identified Nickell as a customer.
- The FBI's suspicions grew even greater after Nickell told agents that she had bought the two tainted packages she had on two separate occasions and from different stores. Digging further into Nickell's background, agents discovered the recent insurance policies on Bruce Nickell and found that his signatures on them had been forged.
- The break in the case came in early 1987 when Nickell's daughter from a prior relationship told police that her mother had spoken about wanting to kill her current husband. The daughter knew that Nickell had even researched poisoning methods at the public library.
- Why did Stella come forward if all she wanted was to get rid of her husband? The insurance carried on Bruce Nickell paid an additional \$100,000 if his death was ruled an accident, plus there was the chance of cashing in on a lawsuit against Bristol-Meyers. Nickell was sentenced to 90 years in prison in the first case prosecuted under the new federal laws prompted by the Tylenol murders.

The Pepsi Hoax

- There is a technical difference between a fraud and a hoax. Fraud nets the perpetrator some financial or personal gain, whether by harming someone else or not. A hoax is an act that's humorous, malicious, or both but not intended to gain any real benefit for the originator. A case from 1993 involving reports of hypodermic needles found in Pepsi cans serves as an example of a hoax.
- The first report came from an 82-year-old man in Tacoma, Washington. Within the next week or so, more than 60 reports of hypodermic needles found in Pepsi cans spanned 24 states, and the story became headline news. In addition to hypodermic syringes,

also reported were screws, a sewing needle, a bullet, and a crack cocaine vial.

- Pepsi brought the media into its bottling plants to demonstrate how unlikely it was that the reports were true. The plants produced 2,000 cans a minute, each one open for just 0.9 seconds. At that rate, tampering was literally impossible. Pepsi refused to issue a recall, and eventually, it was determined that not one of the claims was true; the allegations represented a vicious copycat cycle.
- Pepsi's CEO went on television with the head of the FDA to emphasize that the penalty for fraudulent product-tampering claims was five years in prison and a \$250,000 fine. The CEO promised that Pepsi would seek out and prosecute hoaxers. In the end, 53 people were arrested, and the incident cost the company an estimated \$35 million.

Piltdown Man

- The story of Piltdown man is one of the most famous scientific hoaxes in history. In 1912, an amateur archaeologist named Charles Dawson reported on five thick skull fragments of what appeared to be a primitive hominid discovered in the Piltdown quarry in Sussex, England. Dawson was affiliated with the British Museum and was delighted with the find, which seemed to show that a cradle of humanity was in England.
- The specimen was given the scientific name *Eoanthropus* (meaning "dawn of man"), followed by Dawson's self-tribute—*dawsoni*. It showed both human and ape characteristics and was quickly touted as the missing link scientists had been seeking for nearly half a century. Other hominid fossils had been found in Germany, France, and Asia.
- Two main discoveries were made: One at Piltdown in 1912 and one allegedly found two miles away in 1915. Dawson brought the British Museum two partial skulls, half of a lower jaw, and one canine tooth, all attributed to *Eoanthropus dawsoni*, along with

a tool made of carved elephant bone and the fossil teeth from a number of other animals from the Pleistocene Epoch.

- From the start, both American and French paleontologists criticized the Piltdown find, but objections quieted down a bit after papers were published about the second skull in 1917. Piltdown man took his place in fossil history. It wasn't until 1953 that the scientific community finally learned that Piltdown man was a complete hoax.
- Existing cracks in the Piltdown story were significantly weakened in 1949 when the specimens were analyzed by British physical anthropologist and paleontologist Kenneth Oakley, one of the pioneers of dating fossils using fluorine content. Oakley determined that the two Piltdown skulls were from humans of the medieval period, probably about 620 years old. The jaw was about 500 years old and from a Borneo orangutan.
- Later testing showed that a weak acid solution had been used to remove some of the mineral content from the skull fragments, and a stain containing iron had been applied to age them. The molars from the orangutan jaw had been filed down flat to appear more humanlike. Microscopic examination showed that the canine tooth had also been filed down and covered with brown paint; a piece that had been broken was reattached with chewing gum covered with sand.
- To this day, no one knows for sure who tainted and planted the specimens—whether it was Dawson alone or in collaboration with others or whether Dawson was given the finds and simply took credit for them. It has been suggested that the doctoring of the evidence was done at the same time, after which the quarry was salted with the specimens.
 - The perpetrator had to have a certain amount of paleontological and anatomical knowledge to pull off the scam, which is why some suspect that Dawson, an amateur, was a pawn in a game created by others. Still, some of Dawson's other finds have been determined to be hoaxes in modern times.

- Among the other suspects in the Piltdown hoax are Sir Arthur Conan Doyle, the creator of Sherlock Holmes; a zoologist named Martin Hinton who worked at the British Museum; and Arthur Smith Woodward, the head of the museum's Natural History Department.
- In 2012, the 100th anniversary of the Piltdown discovery, scientists made new attempts to conduct sophisticated testing on the specimens. DNA, however, has been difficult to extract. Modern radiocarbon dating puts the estimated age of the skull fragments at about 1,000 years, twice the 500 years that Oakley's fluorine analysis suggested but nowhere near old enough to contribute to our understanding of human evolution.



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Sir Arthur Conan Doyle may have been involved in the Piltdown hoax; he was an amateur bone hunter and actually dug at Piltdown with Charles Dawson.

The Disappearance of John Stonehouse

- During a business trip to Florida's Miami Beach on November 20, 1974, British cabinet minister John Stonehouse told companions that he was going for a swim. When he didn't return to the hotel, investigators found a pile of his clothing on the beach. Apparently, Stonehouse had drowned or, perhaps, was attacked by a shark.
- Stonehouse, who was 49 at the time of his disappearance, had held several political posts for his country and had aspirations to become prime minister. But a string of failed business ventures in the early

1970s had tarnished Stonehouse's political future, and by the time of his disappearance, bankruptcy was looming. Stonehouse had been married for more than 25 years and had three children.

- Some of Stonehouse's friends were suspicious that members of organized crime or opposing political factions might have killed him, but a month after his disappearance, Australian police found Stonehouse living in a Melbourne resort community.
 - He had entered the country from Hawaii one week after disappearing, using a forged passport in the name of J. D. Norman. Once in Australia, Stonehouse called himself Clive Mildoon and opened bank accounts.
 - Further investigation into his movements showed that Stonehouse had left Australia the day after he first arrived there and traveled to Lebanon, Singapore, and Denmark (where he stayed for a time with his 28-year-old secretary, Shelia Buckley) before returning to Australia alone on December 10.
- Prior to his disappearance, Stonehouse had obtained passports and credit cards in several names and a birth certificate for Clive Mildoon. With those, he had opened Australian and Swiss bank accounts using overdraft loans from his U.K. banks. With that knowledge, Australia deported Stonehouse to face British authorities.
- Stonehouse claimed that he had suffered a mental breakdown and that his alternate names were akin to multiple personalities. At his trial, the prosecution asserted that the breakdown was moral, rather than mental. In the summer of 1976, Stonehouse was sentenced to prison for seven years on various counts, including fraud, deception, and theft. After his release, he married his former secretary and wrote spy thrillers. He died in 1988 at the age of 62.

Suggested Reading

Farquhar, *A Treasury of Deception*.

Innes, *Fakes and Forgeries*.

Spencer, *Piltdown*.

Weiner, *The Piltdown Forgery*.

Questions to Consider

1. What were some of the slip-ups Stella Nickel made that allowed police to follow her trail of evidence and apprehend her?
2. What's the key difference between a fraud and a hoax?
3. Given the nature of science, what are some of the dangers in scientific hoaxes, such as that of the Piltdown man?

Frauds and Forgeries

Lecture 8

There are three main ways to perpetrate art fraud: (1) Create a piece of artwork and sell it as an original by someone famous, (2) resell a known fraud as an original, and (3) credit an existing piece of artwork to a known artist and sell it for a high price. In this lecture, we'll look at two interesting cases that fall into the first category. We'll also explore the hoax perpetrated by the writer Clifford Irving, who claimed that he had been authorized by Howard Hughes to write the billionaire's biography.

Elmyr de Hory

- In 1946, in Paris, France, a Hungarian named Elmyr de Hory sold a Picasso drawing to Britain's Lady Malcolm Campbell for a little less than \$100. Shortly thereafter, de Hory began selling other Picassos to art galleries around Paris. He explained that his parents had been aristocratic Jews killed in the Holocaust, and the remarkable pieces of artwork were remnants of their vast estate prior to imprisonment.
- Using some of his proceeds, de Hory traveled, selling other pieces of artwork for even larger sums. He ultimately settled in Miami, Florida, in 1950 and worked as an art dealer. He sold works from Picasso, Matisse, Renoir, and Modigliani.
- As you might guess, de Hory created all of these masterpieces himself. A key to his success was that he didn't reproduce existing works but drew and painted new pieces in the style of great artists. He also used pseudonyms and sold artwork through the mail, enabling him to stay one step ahead of authorities for many years.
- At times, de Hory struggled to become a celebrity artist in his own right, but he continued to find more success in forgery. His life was marked by stormy personal relationships, including with associates in his con game who cheated him out of millions of dollars. He

suffered through occasional legal battles when deceptions were detected and was essentially on the run throughout Europe.

- Eventually, de Hory decided to go to Spain and face the music. Though the courts there tried to convict him of numerous charges, de Hory wound up with a sentence of only two months in jail because no one could prove that he had created any of the fraudulent artwork within Spanish borders. There were also questions about the legality of calling his works forgeries because de Hory rarely signed the works with the name of the artist he was imitating.
- His crimes made de Hory infamous, and once he was released from prison, the value of his forgeries increased. Not only that, but his celebrity created public interest in his own artwork. He appeared on television shows, and the author and investigative reporter Clifford Irving wrote his biography in 1969.
- But in late 1976, when de Hory found himself faced with criminal extradition to France, he took an overdose of sleeping pills and ended his life. It's unknown how many forgeries he created or how many are still in circulation and presumed authentic.

John Myatt

- In 1985, John Myatt was a struggling art teacher in England when a friend offered to pay him to reproduce a famous painting. Later, Myatt's friend remarked that the copy was so good it fooled many people who saw it.
 - To raise cash, Myatt then put an ad in a London magazine indicating that he would create 19th- and 20th-century fakes on request for a cost of \$240. He didn't intend to defraud anyone; he just needed money.
 - A con man named John Drewe ordered some masterpieces by Myatt and was so impressed that he persuaded Myatt to work with him to try to pass the fakes off as originals.

- Drewe's ability to fake the provenance of the works allowed the pair to sell more than 200 fake masterpieces. Drewe was able to gain entry to famous art museums and art houses, where he would steal dealers' stamps and gallery labels and change auction records. This strategy allowed the pair to fool dealers, collectors, and even experts at several of London's best art museums.
- When Myatt heard how much his fakes were selling for, he ramped up his game by using an emulsion that helped the paint dry faster and allowed him to produce even more quickly. Even that didn't catch the experts' eyes for several years. But eventually—after almost 10 years of scamming the art world—authorities became suspicious.
- Ultimately, Myatt confessed and implicated Drewe. The two were arrested, tried, and convicted in February of 1999. Myatt served only four months and Drewe, two years.

Authenticating Art

- An important consideration in authenticating any piece of art is that the methods used must be as noninvasive as possible. Considering the analysis of paintings, for example, there are three main steps in forgery investigation, usually undertaken in the following order:
 - The exam begins with the surface of the painting. *Optical microscopy* or *light microscopy* allows forgery experts to view the details of tiny cracks that naturally form on paint over time. Through this examination, experts judge whether the cracks are authentic, were accelerated using solvents, or were even merely drawn on the surface. When ultraviolet light is applied to a painting's surface, old layers of varnish will dramatically fluoresce, while newer paint on a retouched or forged painting will not.
 - If the surface exam doesn't easily weed out a fake, investigators dive deeper into the background, or *underpainting*, of a piece. Artists commonly reuse canvases over time, whether masters or frauds. Conventional medical X-rays and infrared analyses

can see through layers of paint and detect earlier artwork created on the same background. If the styles of the surface and the underpainting don't match, forgery may be suspected.

- The last step undertaken is an examination of the mediums used in the body of the surface painting. Polarized light microscopy is a basic way to analyze pigments in paint or even ink. X-ray diffraction studies, which look at how a given medium bends X-rays, can reveal the crystalline structure of components within pigments. Some types of crystalline pigments were only discovered and incorporated into paint during certain eras. Thus, if they're used to fake an old master, X-ray diffraction studies can expose the fraud.

- Techniques called *X-ray fluorescence* and *neutron activation* can take authenticators down to the most basic chemical level. In X-ray fluorescence, the object being examined is bathed with radiation, and the pattern of X-rays it emits reveals its elemental breakdown. With neutron activation, the sample is bombarded with energized neutrons, causing some of the atoms in the sample to take up a neutron and become radioactive isotopes. As these isotopes decay, they send out gamma



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One of the easiest ways to detect an art forgery is to show that anything used to create it—such as paint or other natural material—was not available in the place or time the artwork was allegedly created.

rays that identify which elements are present in the paint or other medium.

- *Radiocarbon dating*, which also relies on the decay of radioisotopes, can be used to estimate the age of organic constituents, whether canvas, paint, or other carbon-containing media. But part of the sample is destroyed during the dating, and this technique works only in the range of about 50,000 to 400 years in the past.
- When analysis of three-dimensional artwork, such as a sculpture, is required, *CT scanning* (computed axial tomography) can allow internal views. *Magnetic resonance imaging* (MRI) can also reveal internal aspects of ceramics, bronzes, and wooden sculptures. A new method, *molecular Raman spectroscopy*, relies on lasers to identify both nonorganic and organic pigments, as well as binders used in paint. This technique is overtaking X-ray diffraction studies because it can be performed in the field and is completely nondestructive.

Clifford Irving and Howard Hughes

- The year after his biography of the master forger Elmyr de Hory was published, Clifford Irving told his editors at McGraw-Hill that he had been contacted by the reclusive billionaire Howard Hughes. According to Irving, after reading the de Hory biography, Hughes had decided to ask Irving to serve as his biographer.
- At the invitation of McGraw-Hill, Irving flew to New York and presented three letters from Hughes. In these letters, Hughes stated there were far too many rumors and inaccuracies in circulation regarding his unusual life. The reclusive billionaire wanted these misconceptions cleared up before he died, but he wanted the project to remain a secret until publication, with all contact passing through Irving only. McGraw-Hill had the letters authenticated by a nationally recognized firm and issued two contracts: one for Irving and one for Hughes.

- As most people know, Howard R. Hughes Jr. was born in 1905, the only child of a man who became a millionaire developing technology used in oil well drilling.
 - At age 18, Hughes was orphaned and inherited three-fourths of his father's company and wealth. He went on to become a successful movie producer, created the Hughes Aircraft Company, and invested in various casinos and hotels in Las Vegas.
 - Throughout the 1950s, Hughes became increasingly reclusive. Among other rumored maladies, he was thought to have suffered from obsessive-compulsive disorder. From the 1960s until his death in 1976, Hughes lived in seclusion with a small entourage, moving from one hotel penthouse to another in Las Vegas, Beverly Hills, Boston, London, and elsewhere.
- Of course, as we now know, Irving had concocted the biography scheme in conjunction with another author, Richard Suskind. Both men were counting on the assumption that Hughes would not come out of seclusion and probably would never learn of the pending publishing deal. Irving had Hughes's signature forged on the contract from McGraw-Hill.
- Irving got his hands on the unpublished memoir of a former accountant and friend of Hughes, as well some material about Hughes that had been donated to the Academy of Motion Picture Arts. Using these factual sources, he built his phony biography, filling in what he didn't know with lies. By the fall of 1971, Irving and Suskind had a manuscript of more than 1,000 pages. In December of that year, McGraw-Hill made a public announcement about the project.
- Shortly after the announcement, a journalist named Frank McCulloch—the last person known to have interviewed Hughes, back in 1958—received an angry phone call from a man claiming to be the billionaire. The caller said that the book was a hoax

and that he had never even met Clifford Irving. When Irving was questioned, he claimed that the caller was clearly an imposter.

- Following the coverage of these events in the news, Hughes surfaced and announced that he would hold a teleconference to be recorded by seven journalists and aired at a later date. Within weeks of the teleconference, Irving and his wife admitted to the hoax, and Suskind soon followed. Ultimately, the three faced several state and federal charges, including mail fraud, forgery, and perjury. In the end, Clifford pled guilty and served 17 months, and Suskind served 5 months.

Suggested Reading

Farquhar, *A Treasury of Deception*.

Innes, *Fakes and Forgeries*.

Irving, *Fake*.

———, *The Hoax*.

Nilsen, *Art Fraud Detective*.

Shelton, *Forensic Science in Court*.

Warden and Drizin, eds., *True Stories of False Confessions*.

Questions to Consider

1. Can you identify some other famous examples of art frauds or document forgeries throughout history?
2. What kinds of items or materials are forged and why?

Blood Doping and Other Sports Scandals

Lecture 9

More than 100 years before competitive cyclist Lance Armstrong used performance-enhancing drugs, other professional cyclists were already doing the same thing. In particular, English cycling coach Chippy Warburton encouraged the use of racing drugs as early as 1891, when the 350-mile Bordeaux-to-Paris cycling race first took place. Competitors were known to use stimulants, such as caffeine and cocaine, as well as nitroglycerine, which dilates vessels to help deliver more blood to body tissues, and even strychnine, which is excitatory to the nervous and muscular systems. In this lecture, we'll look at Armstrong's case and a number of other well-known sports scandals.

Lance Armstrong

- America's most well-known cyclist of the recent past is Lance Armstrong. Born in Texas, Armstrong turned pro in 1992 at age 21 and, within the next few years, won major competitions. In the 1996 summer Olympics, he cycled for the United States, coming in 6th in time trials and 12th in the road race. But Armstrong's athletic career had to be put on hold in October of 1996, when he was diagnosed with testicular cancer.
- Armstrong underwent surgery and successful treatment. Incredibly, by the late 1990s, he was not only back in competitive cycling but began a series of seven consecutive first-place wins in the Tour de France between 1999 and 2005. He announced his retirement from the sport in the summer of 2005, only to make a comeback in 2009 and take third place in that year's Tour de France.
- In early 2011, Armstrong retired again but this time under a cloud of shame. After years of denying claims that he used performance-enhancing drugs, in 2012, Armstrong was accused by the U.S. Anti-Doping Agency (USADA) of being part of "the most sophisticated,

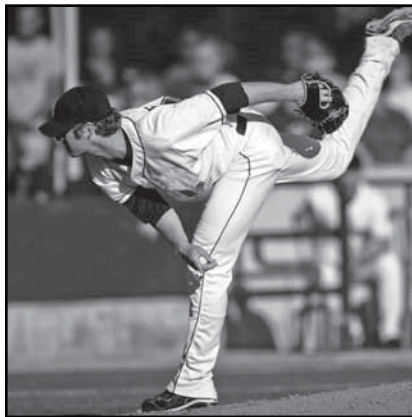
professionalized and successful doping program that sport has ever seen.”

- Although allegations had been made for years, the first highly publicized suspicion dates to 1999, when Armstrong’s urine tested positive for corticosteroids during preliminary drug testing for the Tour de France. To explain the positive result, Armstrong’s team doctor produced a prescription for a steroid ointment he said was used to treat a saddle sore Armstrong had developed. It’s now known that the physician backdated the prescription.
- Another hormone that has been used by athletes is erythropoietin (EPO). This substance is made by the kidneys to increase red blood cell production in bone marrow. Because red cells deliver oxygen to muscles, the use of EPO ultimately enhances endurance. During Armstrong’s hearings, many of his teammates admitted to using EPO and testified that he did, too.
 - Teammates also claimed that Armstrong helped supply them with testosterone, human growth hormone, and other banned substances that he pressured them to use.
 - Further, teammates described undergoing reinfusions of their own blood and disposing of drugs when they thought police were about to raid their van.
- Ultimately, the forensic evidence used by the USADA in the summer of 2012 included lab reports from blood samples taken during Armstrong’s 2009–2010 comeback, as well as e-mails, photographs, and financial documents. Armstrong was indicted by the agency for using banned substances and for possessing and trafficking in drugs. Law enforcement authorities did not file criminal charges.
- Armstrong refused to respond or even request a hearing to challenge the charges. But in 2013, he finally admitted that he had been involved in the use of performance-enhancing drugs. The cyclist

alleges that he stopped doping in 2005 and that his comeback wins in and after 2009 were unaided by banned substances.

Major League Drug Use

- In 1998, baseball fans were caught up in the race between Mark McGwire and Sammy Sosa for the most homeruns in a single season; both were on track to surpass the 1961 record of 61 homeruns hit by Roger Marris. By the end of the season, McGwire had hit 70 and Sosa, 66.
- Seven years later, in 2005, both record breakers, as well as many other stars, were called to testify before Congress on the use of performance-enhancing drugs in baseball. In that same year, outfielder and power hitter José Canseco admitted to drug use in his book, *Juiced*. Canseco claimed that the vast majority of other Major League Baseball players also used steroids.
- In 2006, baseball commissioner Bud Selig asked Congress to institute an investigation into the use of steroids and human growth hormones in his sport. As a result of the investigation, baseball enhanced its drug-testing policies and made penalties for users more severe.



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By the 1960s and 1970s, according to many professional players, both amphetamines and steroids were widely used in baseball.

Nancy Kerrigan and Tonya Harding

- Even before they had reached their teenage years, both Nancy Kerrigan and Tonya Harding were promising figure skaters. Tonya

was a strong, athletic performer, and Nancy was tall, elegant, and graceful. Both began entering and winning competitions, and each earned a spot at the 1992 winter Olympics, where Nancy won the bronze medal, while Tonya came in fourth.

- In January of 1994, the U.S. Figure Skating Championships were scheduled for Detroit. The day before the competition began, as Kerrigan was leaving the practice ice, a man ran up behind her and hit her just above the right knee with some type of club, knocking her to the ground. The suspect ran off; witnesses reported that he got into a waiting car and sped away. The next day, Harding won first place, while Kerrigan nursed a bruised right thigh.
- A man named Shawn Eckhardt confessed to his minister and friend that he was part of a conspiracy to attack Kerrigan. Eckhardt was Tonya Harding's personal bodyguard and the lifelong friend of her ex-husband, Jeff Gillooly. The minister reported the incident to two of his college professors: an ethics professor who was also an attorney and another professor who was a private detective. Eckhardt had an audiotape of the four conspirators discussing their plan.
- The attorney/professor agreed to represent Eckhardt in any subsequent legal actions against him if the minister would take the allegation to the FBI. Ultimately, the FBI picked up Eckhardt for questioning, and the bodyguard confessed.
 - Eckhardt claimed that it had been Gillooly's idea to eliminate Kerrigan from the competition to promote Harding's chances of winning the U.S. Championships and going on to the Olympics.
 - Because both Eckhardt and Gillooly were known to be closely associated with Harding, they had brought another man, Shane Stant, into the plan. Stant agreed to damage Kerrigan's right knee for \$6,500.
 - The conspirators initially planned to attack Kerrigan at her home rink in Massachusetts, but by the time Stant reached

Massachusetts, Kerrigan was already on her way to the championship in Detroit.

- Stant and his uncle, Derrick Smith, cased the arena in the days before the assault. The weapon Stant used was a collapsible police baton, and after hitting Kerrigan, he tried to run to the exit door he had scouted out the day before, but it was now chained shut. He rammed through the Plexiglas panel to make his escape, threw the baton away, and jumped into his uncle's car. Nobody got a good look at him because all eyes and cameras were on Kerrigan.
- After winning the championship, Harding—along with Gillooly, Eckhardt, and Smith—returned to Portland, Oregon. But one week after the attack, Eckhardt and Smith were arrested and charged with conspiracy to commit assault. FBI agents arrested Stant the next morning in Phoenix. Both Gillooly and Harding denied involvement, but evidence discovered later solidly implicated them in the plot.
- In February 1994, Jeff Gillooly pled guilty to racketeering; he received two years in prison and a \$100,000 fine. The other three conspirators were indicted and all received jail sentences. Both Kerrigan and Harding skated in the winter Olympics, but the following month, Harding pled guilty to conspiracy to hinder prosecution. She was sentenced to three years' probation, 500 hours of community service, and a fine of \$165,000. She still alleges that she had no prior knowledge of the plan to sabotage Kerrigan.

The 1919 World Series

- The 1919 World Series was a best-of-nine series, rather than the usual best-of-seven. It was to be a contest between the Cincinnati Reds and the Chicago White Sox, but the Sox's first baseman, Arnold "Chick" Gandil, apparently convinced seven of his teammates to deliberately lose the series. Their incentive was payment promised from organized crime members, who would bet against them. Gandil apparently wanted to get back at the White

Sox owner, Charlie Comiskey, who had a reputation for paying low salaries.

- The Sox players managed to throw four of the first seven games. On the night before the eighth game, Claude “Lefty” Williams, a Sox pitcher, was visited by some mobsters, who threatened to kill him and his wife if he didn’t lose the next day; Williams lost the series for the Sox.
- During the following season, rumors of the fix spread, and in September of 1920, two players, Eddie Cicotte and outfielder “Shoeless” Joe Jackson, confessed to a grand jury. In October of 1920, the grand jury handed down indictments naming eight Chicago players. Shortly after the defendants were arraigned, the confessions of Cicotte and Jackson went missing. At trial in 1921, despite eyewitness testimony from teammates, all eight players were acquitted, but the commissioner of baseball banned them from the game for life.

“Mr. Baseball”

- Born and raised in what is now a rundown Cincinnati neighborhood, Pete Rose eventually became baseball’s all-time hit king. His first 15 professional years were spent in Cincinnati, but he moved to Philadelphia in 1979, when the Phillies offered him a four-year contract for \$3.2 million. Following that, Rose played a year for the Montreal Expos before coming back to his hometown in 1984 to finish his career. Rose was a player/manager for two years, then managed full time until 1989.
- Back in Cincinnati, Rose was known to have problems with gambling; he was often seen at the horse track, but suspicions also emerged that he had been betting on baseball. In early 1989, the baseball commissioner appointed a lawyer to investigate, and by the spring of that year, a 225-page report had been compiled showing evidence of Rose betting on 52 games.

- Although there was no evidence that Rose bet against the Reds, any betting on baseball is strictly forbidden by anyone associated with Major League Baseball. In the summer of 1989, Rose agreed to a voluntary lifetime ban from the sport and a settlement with the league. His compromise had three provisions: (1) The league would stop its investigation and make no finding of fact; (2) Rose would neither admit nor deny the charges; and (3) Rose could apply for reinstatement after one year.
- In 2004, just before the release of his autobiography, *My Prison without Bars*, Rose publicly admitted to betting on baseball. He has applied for reinstatement twice and has been refused.

Suggested Reading

Albergotti and O'Connell, *Wheelmen*.
Canseco, *Juiced*.
Finley, Finley, and Fountain, *Sports Scandals*.
Macur, *Cycle of Lies*.
Prouse, Torke, and Strozier, *The Tonya Tapes*.
Rose and Hill, *My Prison without Bars*.

Questions to Consider

1. Can you think of any professional sports in which performance-enhancing drug use is far less likely than others?
2. Some have said that blood doping should be permitted as just another way for athletes to get ahead, to complement anatomical and physiological differences that already naturally exist among people. Do you agree or not?
3. Do you think Pete Rose belongs in the Baseball Hall of Fame?

Bad Boys of U.S. Politics

Lecture 10

You might be surprised to learn the name of the president whom many consider to be the worst in all of U.S. history. This man had extramarital affairs and paid large sums of money to keep them under wraps, took part in a major political scandal involving natural resources, and placed his friends in high government positions for which they had no experience. In this lecture, we'll discuss this president—Warren G. Harding—as well as some other well-known politicians who have been involved in their own scandals in more recent times.

Warren G. Harding

- Warren Harding was born in north-central Ohio in 1865, just months after the end of the Civil War and Lincoln's assassination. He worked on the family farm and graduated with a degree in journalism from Ohio Central College. Shortly after graduation, he and two friends bought the struggling *Marion Daily Star* in Marion, Ohio, and turned it into a success. Harding often wrote the paper's conservative editorials and, within a couple of years, became its editor and sole owner.
- Said to be charming, handsome, and eloquent, Harding became a local leader, with roles in various fraternal organizations and charitable groups. In 1891, he married a wealthy divorcee, Florence Kling DeWolfe. She was the daughter of a rival newspaperman and helped make Harding's paper a success. Florence also encouraged her husband to go into politics.
- Harding probably married Florence for her status in society—not for love—but he is said to have loved many other women during his life. He had a 15-year affair with a friend of his wife's, Carrie Phillips. Indeed, as events led up to Harding's presidential nomination, Phillips threatened to expose the affair to the public using love letters from Harding. In response, the Republican

National Committee paid her a monthly stipend to keep quiet and sent her on an extensive overseas trip. Harding was elected president in 1920.

- In 2009, Ohio attorney James Robenalt published an exposé of the affair based on the love letters. His book points out that Phillips was a German sympathizer and, perhaps, a German operative. She may have persuaded Harding not to run against the Democratic incumbent, Woodrow Wilson, in 1916.
- Robenalt notes that if Harding had run and beat Wilson in 1916, the United States may never have entered World War I—all due to Carrie Phillips's love of Germany and her influence over Harding. Minimally, Harding would have been the war president rather than Wilson, and things may have proceeded quite differently during the war.

Anthony Weiner

- Carrie Phillips had a paper trail of love letters from Harding, but she took the hush money from the Republican National Party and quietly went away. A modern politician, Anthony Weiner, was not as lucky in covering up his sexual exploits.
- In 2011, Meagan Broussard accepted payment to reveal the indiscretions of Weiner, who was at the time a Democratic congressman.
 - Today's digital technology has revolutionized the ability to nearly instantly trace communications to their source, and that's what happened when the married congressman sent a graphic image of himself—using his public Twitter account—to a 21-year-old college student named Gennette Cordova.
 - Although Weiner's post was almost immediately removed, it had already been forwarded to a political blogger. When that source made Weiner's naughty image public, the congressman said that his account had been hacked and that the images were not of him or that they had been digitally modified to appear sexual in nature.

- Weiner claimed that the incident was a prank intended to damage his political career but said he would hire his own private investigators rather than have the FBI look into the case.
- Apparently, the incident with Cordova was just the tip of the iceberg. Weiner had been sending similar images to young ladies for several years. When Broussard learned about the photos Weiner sent to Cordova, she confided to several friends that she, too, had received similar images. One of her friends convinced Broussard to share her experience with a conservative blogger, who broke the lid off the story.
- Shortly after that, *ABC News* reportedly paid Broussard between \$10,000 and \$15,000 to supply images, emails, and cell phone logs that documented Weiner's shady behavior. As soon as Weiner learned that ABC was in possession of his messages to Broussard, he held a press conference and admitted he had lied when denying that he sent the images.

Paternity Testing

- Among Harding's longtime mistresses was another woman named Nan Britton, 30 years younger than her lover. In 1919, she gave birth to a daughter. Allegedly, Harding never met Britton's child and never claimed to be her father, but he provided Britton with financial support. Whether or not the child was Harding's has never been conclusively proven.
- ABO blood groups were discovered at the turn of the 20th century, and by the 1920s, it was established that blood types were inherited; this was the key to their use in determining paternity. But it wasn't until about 1935 that some states began to accept ABO testing in paternity suits.
- Since the mid-1980s, modern paternity testing has relied on nuclear DNA comparisons. Nuclear DNA is inherited from both parents and can be found in all body cells, except red blood cells, which lack a nucleus. Given the availability of this approach, it may seem

surprising that it isn't always used to determine paternity in high-profile political scandals.

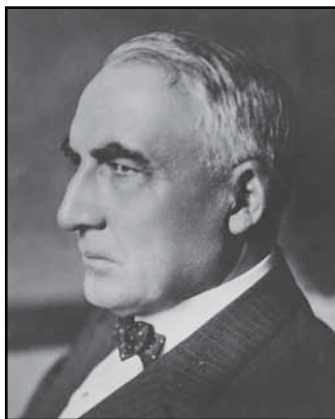
- For example, Arnold Schwarzenegger, the former governor of California, never even suggested DNA testing when the media learned that he had fathered a son with his longtime mistress, Mildred Patty Baena. Schwarzenegger said that he realized the boy was his because of the strong resemblance that began when the child was a toddler.
- Schwarzenegger's case contrasts sharply with that of John Edwards, John Kerry's vice presidential candidate in 2004. Edwards cooked up an elaborate scheme to cover up the fact that he had fathered a child with his lover, cinematographer Rielle Hunter.
 - Edwards convinced one of his political aides and closest friends, Andrew Young, to publically claim that he was the father of Hunter's child. When details about the scheme eventually began to emerge, Young revealed that Edwards had asked him to get one of the baby's diapers and have a paternity test done to determine if Hunter's child was really his.
 - As time went on and allegations continued to swirl that he was the baby's father, Edwards agreed in an interview to take a paternity test, but Hunter refused. Finally, when Young decided to come clean in early 2010, Edwards admitted that he was the father of Hunter's child.

Scandals in the Harding Administration

- During his rise to the presidency, Harding served as a U.S. senator and lieutenant governor of Ohio, a role through which he made many state connections. As a conservative Republican, Harding sought to return the country to "normalcy" after World War I and the progressive policies of his predecessor, President Woodrow Wilson.
- But Harding told close friends and advisors that he was "not prepared to be president." He delegated decisions to others and rewarded old friends by appointing them to political positions.

Members of his “Ohio Gang” included Harry Daugherty, who became attorney general; Jesse Smith, Daugherty’s assistant; Albert Fall, secretary of the interior; and Charles Forbes, director of veterans affairs.

- Before Watergate, the Teapot Dome Scandal was largely regarded as America’s greatest political scandal.
 - Before Harding’s presidency, the government had acquired three large plots of land—two in California and one in Teapot Dome, Wyoming—that contained huge reserves of oil. This oil was set aside for use by the U.S. Navy, and Congress had given the naval secretary power to oversee the reserves.
 - But just three months after Harding was elected, Albert Fall convinced the naval secretary to turn responsibility for the reserves over to Harding, who then put Fall in charge. Fall leased the land to some of his cronies in the oil business, netting himself \$360,000 in bribery money. After the story broke in 1922, a Senate investigation was undertaken, and Fall became the first former cabinet member ever to be sent to prison.
- Another scandal involved Charles Forbes, whom Harding had appointed director of veterans affairs. In less than two years at his post, Forbes embezzled almost half of the \$5 million he had been allocated for the care of veterans. An investigation revealed that Forbes had allowed improper bids from contractors, resold hospital supplies at a profit, turned down legitimate disability claims, and



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Harding and his “Ohio Gang” are said to have met weekly at what was known as the “Little Green House on K Street” in Washington, DC, for poker, drinking, and wild parties.

pocketed money set aside to fill jobs in veterans' programs. He was convicted of defrauding the government and sentenced to two years in jail.

Harding's Final Illness

- In 1923, as the political scandals heated up, Harding took a damage-control trip out west. Before leaving, he allegedly told his attorney general, Daugherty, that he wanted Jesse Smith, Daugherty's assistant and, possibly, his lover, gone by the time the trip ended. Smith was later found with a gunshot wound to his head, and his death was ruled a suicide, but many believed that he was murdered because he knew too much about illegal operations in the Harding administration.
- While on the trip, Harding became ill. Although he was accompanied by his personal homeopathic doctor, Charles Sawyer, the president was treated by a U.S. Navy physician, who diagnosed the problem as an enlarged heart.
 - Sawyer, however, believed that Harding had food poisoning and treated him with purgatives to induce vomiting. Harding managed to deliver a speech in Seattle but was too weak to make a planned appearance in Oregon.
 - Fluids accumulated in Harding's lungs, and he developed pneumonia. From a clinical standpoint, an enlarged heart, body weakness, and fluid in the lungs are all classic symptoms of congestive heart failure.
 - When Harding was taken to a hotel in San Francisco, a number of doctors examined him, but on August 2, 1923—with only his wife in attendance—Harding died. On the advice of Dr. Sawyer, Mrs. Harding refused to permit an autopsy, and the president's body was quickly transferred to the train depot and on to Washington for a funeral.
 - Suspicions were immediately raised about Dr. Sawyer's medical care and whether Florence Harding may have poisoned

her philandering husband, but the conferring physicians agreed that the cause of death was a stroke.

- Our look at both the life and death of Warren G. Harding illustrates the types of scandals and mysteries that have surrounded politicians since the dawn of government. In the past, the true stories of many such incidents may have been lost to history or personal discretion. But today, modern forensic technologies can be used to seek out the truth whenever dirty politics or dirty politicians are suspected.

Suggested Reading

Britton, *The President's Daughter*.

Farquhar, *A Treasury of Deception*.

———, *A Treasury of Great American Scandals*.

Mee, *The Ohio Gang*.

Primorac and Schanfield, eds., *Forensic DNA Applications*.

Robenault, *The Harding Affair*.

Questions to Consider

1. Were you surprised by the choice of history's worst U.S. president presented in the lecture?
2. Do you think men in politics are involved in more sex scandals than those in other professions? If so, what do you think is the cause of this phenomenon?
3. What lines of evidence do we have now to unravel political scandals (of any type) that investigators didn't have 50 years ago, 100 years ago, or 200 years ago?

Criminals of the Wild, Wild West

Lecture 11

The 19th-century westward expansion of the United States beyond the Mississippi River was a colorful time in American history, full of prospectors, cowboys, bad boys, and lawmen. Three such legendary characters were born in the span of just six years: Wyatt Earp in 1848, Jesse James in 1847, and Alferd Packer in 1842. In this lecture, we'll take a look at these notorious figures of the great frontier known as the Wild West and see what connections they have to forensic science, past and present.

Wyatt Earp

- In 1869, when he was 21 years old, Wyatt Earp took the position of constable in the town of Lamar, Missouri. He soon married, but within a year, his pregnant wife died from typhoid fever, and other parts of his life began to unravel.
- Earp was caught embezzling money from local schools and falsifying legal documents and was charged with horse theft. He was taken into custody in 1871 but escaped before trial, heading back to Illinois, where his brother Virgil was a saloonkeeper.
- Wyatt and Virgil eventually wound up in the silver-mining town of Tombstone, Arizona, where Virgil was appointed Deputy U.S. Marshall. Three of their other brothers—James, Morgan, and Warren—also came to Tombstone, as did Wyatt's friend Doc Holliday, a dentist and skilled gunman.
- Among the most notorious outlaws in Tombstone were two sets of brothers: Frank and Tom McLaury and Ike and Billy Clanton. The four were well-known for stagecoach robberies and horse theft and had threatened the Earp brothers after Virgil's attempts to bring them to justice. In September of 1881, friends of the McLaurys—Pete Spence and Frank Stilwell—robbed a stagecoach, and Virgil and Wyatt went out with the sheriff's posse to track the bandits.

- We may not think of the Wild West as a place where forensic science was practiced, but while examining the scene, Wyatt noticed an odd-shaped boot print. And just as investigators might do today—comparing footwear evidence and manufacturer’s data—Wyatt consulted the local cobbler. When Wyatt described the unusual print, the shoemaker identified the boot as belonging to Stilwell, who was subsequently arrested, along with Spence. But the robbers had arranged alibis, and the charges against them were dropped.
- During the course of the proceedings, however, one of the McLaury brothers confronted Morgan Earp and threatened to kill the Earp brothers if they ever tried to arrest any of the gang again. These events seem to be among the last straws leading to the infamous gunfight at the O.K. Corral.
- On October 25, 1881, Ike Clanton got into a drunken argument with Doc Holliday and vowed that his gang would settle the score with Doc and the Earp brothers. The next day, October 26, the Clanton and McLaury brothers were seen near the O.K. Corral, brandishing guns, a violation of an ordinance against carrying guns in the city.
- Because they were lawmen, Virgil and Morgan were permitted to carry guns, and Virgil quickly deputized Wyatt and Doc. That afternoon, when the Earps and Doc found the outlaws, Virgil told them to turn over their weapons, and that’s when the shooting began. The legendary gunfight lasted only about 30 seconds. Billy Clanton and both McLaury brothers were killed, and Ike Clanton and a companion got away. Virgil, Morgan, and Holliday were all injured, but Wyatt Earp was unharmed.
- Testimony at the hearing after the incident was conflicting and, in some cases, not credible. Had the incident taken place today, ammunition collected during autopsies or at the scene could be compared to bullets test-fired from any confiscated guns to identify specific shooters. Detailed autopsy methods could help show the direction of bullets fired, which could be compared to eyewitness accounts.

- Ultimately, the judge ruled not to bring the Earp brothers and Holliday to trial due to insufficient evidence. But the gunfight wasn't over.
 - Virgil was ambushed and shot in December of 1881—possibly by Ike Clanton—and lost the use of his right arm. Morgan died in March of 1882 after being shot through a window while shooting pool; witnesses said that they had seen Frank Stilwell running from the scene.
 - Wyatt vowed to kill the remaining outlaws involved. Wyatt, his brother Warren, Doc Holliday, and a few others formed a posse that may have killed Stilwell and claimed to have killed more than a dozen others suspected in Morgan's death or Virgil's injury.

Jesse James

- Jesse James was born in 1847 in Clay County, Missouri. Although he was never in the army, he began his lawless days, along with his older brother, Frank, engaged in guerrilla warfare against Union troops and their supporters in Missouri.
- Anti-slavery unionists ran many of the banks in Clay County; thus, the James brothers began robbing banks to show their contempt. The James gang joined forces with the Younger brothers, fellow Confederate sympathizers. In 1872, the group robbed the ticket office of the Kansas City exposition in front of more than 10,000 people, firing a shot that wounded a young girl. Despite the injury to the child, a cult status began to grow around the James gang.
- As the gang grew in size, their crimes became more notorious; they now held up stagecoaches and trains, as well as banks. The estimated tally of their crimes included 12 banks, 7 trains, and 4 stagecoaches. In response, two freight companies hired the Pinkerton Detective Agency to find and apprehend the outlaws.
- By 1882, Frank James decided to give up the life of robbery, as did several other gang members. As the group grew smaller, Jesse asked two brothers, Bob and Charlie Ford, to move in with him.

- On the morning of April 3, 1882, as Jesse and the Ford brothers were preparing for a robbery, Bob allegedly shot Jesse in the back of the head, and he died later that day.
- It has been claimed that the Ford brothers turned on Jesse because they had a deal with the Missouri governor. When they took credit for the killing and went to collect the reward, they were charged with murder, pled guilty, and were sentenced to hang—all in the same day. A few hours before the execution, however, the governor pardoned them.
- Almost immediately, rumors emerged that the Ford Brothers had staged Jesse's death to enable the outlaw to run away for good. There were claims that someone else was actually buried in James's tomb.
 - In 1948, a 101-year-old man named J. Frank Dalton claimed to be the living Jesse James, but his story didn't hold up under questioning.
 - In 1995, around the time mitochondrial DNA testing first came into forensic use, a team of researchers exhumed Jesse's grave. The samples they took from the remains matched two of Jesse's living relatives, but some people claimed that the body in the grave could be some other relative of the James family.
 - In 2007, an FBI facial recognition expert compared photographs of J. Frank Dalton and Jesse James and concluded that they were definitely not the same man; however, the expert also compared antemortem photos of Jesse to his autopsy photos and found discrepancies there, too.
 - In the end, it seems safe to say that while the legend lives on, the man himself probably did not.

Alferd Packer

- In November of 1873, 21 prospectors left Bingham Canyon, Utah, in search of gold. A couple of months later, they reached the camp

of the Ute Native Americans, where Chief Ouray urged them to spend the rest of the winter before braving the mountains in the spring.

- But two weeks later, six members of the group struck out on their own. Among the six was 32-year-old Alferd Packer, who agreed to guide the other five about 75 miles away to an Indian agency near Gunnison, Colorado. They took provisions for 10 days.
- In April of 1874, 65 days after the group had started out, Packer walked into the Los Pinos Indian Agency alone. According to his story, the group had been snowbound for two months in the San Juan Mountains. After consuming their supplies, they tried to scavenge in the wilderness. Because Packer was weak and couldn't keep up, the others left him behind; he found his way to the Indian agency on his own.
- About a month later, when none of the other five men showed up, a search party was organized. This prompted Packer to tell a second story, which has come to us in slightly varying accounts. According to some reports, Packer said that three men had died along the way, and the remaining members of the party had been forced to cannibalize them. In other reports, one of the men had shot another, and Packer and the shooter ate the flesh of the dead man. Packer said that he was forced to kill the remaining man, Shannon Bell, in self-defense.
- In the summer of 1874, a traveling artist for *Harper's Weekly* was in the area. While at a pass near the Gunnison River, the artist came upon the partial remains of five men sprawled across the ground. He quickly drew what he saw—essentially, a crime scene sketch—and took his artwork into town.
- Based on the sketch, authorities believed that there had been a struggle and that the victims had been killed with an axe or hatchet. A coroner traveled to the scene and did an examination, but there are no surviving records of his findings. Packer was charged with

first-degree murder, but before he could be tried, he escaped from jail and was on the run for nearly a decade.

- In 1883, one of the original 21 prospectors recognized Packer in a saloon in Wyoming, and he was rearrested. At his trial, Packer told yet another version of his story: While Packer was out searching for food, Shannon Bell went berserk and killed the other four prospectors with a hatchet while they slept. When Packer returned, Bell came at him with the hatchet, and Packer was forced to shoot Bell. Ultimately, Packer was convicted of five counts of voluntary manslaughter and, in 1886, was sentenced to 40 years of hard labor. In 1901, he received an early parole.
- In 1989, a group of investigators exhumed the remains of Packer's companions and examined their bones. From cut marks found on the bones, a toolmark expert concluded that an axe or hatchet-type implement had made many of the injuries. Cut marks around muscle attachment sites were thought to reflect defleshing. The study suggested murder and cannibalism, but it couldn't corroborate or dispute Packer's final account of events.

Suggested Reading

Gantt, *The Case of Alfred Packer, the Man-Eater*.

Guinn, *The Last Gunfight*.

Hodgson, *Lone Survivor*.

Primorac and Schanfield, eds., *Forensic DNA Applications*.

Sifakis, *Encyclopedia of Assassinations*.

Stiles, *Jesse James: Last Rebel of the Civil War*.

Tefertiller, *Wyatt Earp*.

Triplett, *Jesse James*.

Questions to Consider

1. Some criminals have become cult figures, especially those from the Wild West days. What is your theory on how or why that happens?
2. What realities of the Wild West do you think have not been accurately captured or presented by most Hollywood depictions of the era?
3. Are there any places in the world today that seem similar in any way to our impressions of how life was in the Wild West?

Investigating Incredible Bank Heists

Lecture 12

The United California Bank was located in an affluent neighborhood and had numerous high-powered patrons. On March 24, 1972, when employees tried to open the bank's vault, the state-of-the-art door seemed to be jammed from inside. When the vault was finally opened, workers discovered a large hole blown in the vault's 18-inch-thick reinforced-concrete ceiling. About 500 of the vault's double-key, armor-plated safe deposit boxes were scattered around the room, empty, and an estimated \$8 to \$12 million in cash, stocks, bonds, and jewelry had been taken. In this lecture, we'll delve into this theft—the largest from a bank in U.S. history at the time. We'll also investigate a bank robbery in Australia that took eight years to solve.

Initial Leads

- After the discovery of the theft at the United California Bank in Laguna Niguel in 1972, local law enforcement immediately brought in the FBI. The bureau notified its offices around the country to learn whether the MO at the bank might match any other crimes.
 - Agents from Cleveland, Ohio, reported a string of bank burglaries around their jurisdiction that showed similarities



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Inside the vault of the United California Bank in Laguna Niguel, police found a customized sledgehammer, specially designed with a homemade device on its end to help open safety deposit boxes.

to the California heist. Even more important, Cleveland had a suspect.

- This man was 36-year-old Amil Alfred Dinsio from Youngstown, Ohio, an area heavily associated with organized crime. Dinsio was linked to a series of smaller bank burglaries in northeast Ohio and the eastern United States.
- The FBI needed to find out whether Dinsio had been in California at the time of the robbery. One way law enforcement typically tracks people is by tracing financial transactions, especially purchases. In this case, investigators learned from ticket records that Dinsio and his six-man crew had come through Los Angeles International Airport a week before the heist.
- FBI agents got an identification from an airport taxi driver, who remembered Dinsio for the \$100 tip the man had given him. Records showed that the taxi had driven the men to the home of Dinsio's sister in Orange County, California. Investigators then took photographs of Dinsio and the other suspects to nearby hotels, where one of the desk clerks recognized some of the men.
- Next, investigators examined phone records from the hotel on the night the crew came in and found that one of the numbers called belonged to a real estate agency. They learned that two gang members had leased a furnished condominium that sat in the direct line of sight of United California Bank.
- When FBI agents reached the condo, it had already been professionally cleaned. Agents thought they had reached a dead end until one of the men opened the condo's dishwasher and found a load of dirty dishes. Although months had passed, forensic analysts found the fingerprints of all seven members of Dinsio's gang on items in the dishwasher.
- Other agents also followed up on another phone number called from the gang's hotel. That number belonged to a man who had

previously lived in Youngstown. When agents went to his house, they found the getaway vehicle in the garage with burglary tools in the trunk. Ultimately, fingerprints from five of the suspects were lifted from the car.

Details of the Job

- Once they caught up with the mobsters, authorities learned many more details about the burglary: Dinsio had first made an initial reconnaissance trip to prepare for the job. He had cased the bank and surveyed the typical activities of the local police department. Once he had a plan mapped out in his mind, Dinsio returned to Youngstown to assemble his crew.
- After Dinsio's men arrived in California, they purchased the tools they'd need for the heist, including a ladder, empty sandbags, a variety of hand tools, and a police-band radio.
- On the night of the burglary, Dinsio and four other men drove to the bank, while one of the remaining two monitored the police radio and another stood guard outside the bank. Two of the robbers filled the empty sandbags with soil from a nearby flowerbed. The others put the ladder up to the bank's roof in the vicinity of the outside alarm. Dinsio sprayed the alarm with foam insulation so that when it went off, the clapper couldn't hit the bell.
- The bank's exterior flat roof was made of 0.5-inch plywood, and the burglars easily cut an opening in it large enough to pass through. Once inside the attic crawl space, they patched into the bank's air conditioning unit for electric power.
 - Next, they drilled 15 holes in the 18-inch steel-reinforced ceiling over the vault and put a stick of dynamite in each hole. The bags of soil were then piled on top of the dynamite to force the explosion to travel downward and to act as a silencer for the blast.
 - After setting off the explosion, the men used acetylene torches to cut the reinforcing rebar, then dropped down into the vault.

They also had to bypass another alarm that was wired to go straight to the sheriff's office.

- Amazingly, the bank heist took place over the course of three nights. Dinsio and his crew initially broke in on Friday night and left before dawn, lightly sealing their entry hole in the bank's roof. The men rigged a mirror on top of the entry hatch, knowing that as long as they could see the mirror from the condo window, the break-in hadn't been discovered. They returned to the vault Saturday night and Sunday night.
- After his arrest, Dinsio was convicted of burglary and sentenced to 10 years in prison; his crew members were also prosecuted for their part in the theft. In late 2013, Dinsio published a book called *Inside the Vault: The True Story of a Master Bank Burglar*.

Heist in Melbourne

- In the mid-1990s, the Bank of Melbourne in Victoria, Australia, was a much simpler target for thieves. Easy access to the building could be made through an alley, and the beeps that signaled the opening of the vault could be heard from outside the bank's back door. The bank was also close to a train station, where bandits could easily make a getaway.
- For this heist, the thieves chose Saturday, September 14, 1996, the day of an Australian football semifinal match in Melbourne. Most of the police force was at the stadium for security. The thieves planned to attack after bank workers arrived but before the bank opened for business. They knew that the vault had to be opened then to stock the tellers' cash drawers.
- The night before the robbery, the men used a power saw to cut a large, square groove in the lower part of the bank's back door, cutting only about halfway through the door's depth. This makeshift door-within-a-door would allow them to get in and out of the bank without actually opening the back door and tripping its alarm. This

would buy them a few seconds on the way in, which was important if they were to catch the vault while it was open.

- On the morning of the robbery, the two men waited by the back door for the beeps that would signal the opening of the vault. When they heard their cue, they rammed the weakened back door with steel fence posts, ducked through the opening they had created, and jumped in. While one robber used a gun to control the employees, the other emptied the vault and the tellers' boxes. The pair left with \$137,000 in cash, plus a stash of blank traveler's checks and bank drafts.

Eight-Year Investigation

- During the initial investigation, police collected statements from the three tellers. All described both men as being slim; about 5 feet, 6 inches tall; and with native Australian accents. The pair wore black Janus masks—the traditional pair of theater masks depicting comedy and tragedy—over black, open-faced ski masks. They also wore military-green coveralls and black ski gloves with red stitching.
- A police dog tracked the robbers' scent to the parking lot of the nearby train station but then lost the trail, suggesting that the criminals had gotten into a car left there. On a second trip from the bank, the dog led officers to a dumpster in the alley behind the bank, where they found the theatrical masks and other clothing.
- Police followed a number of leads, checking local theatrical suppliers and stores that sold surplus army clothing, but were unable to learn more information about the robbers. Officers checked out local figures known to be involved in crime and looked into other bank robberies in Victoria but found no patterns. In addition, none of the bank checks surfaced. It seemed as if the case might go cold.
- Scientists in the Victoria police forensic lab decided to test the clothing left behind near the robbery scene for *trace DNA*—that is, background DNA from a possible second wearer. Behind the area of

the mouth opening in each of the Janus masks, they found enough saliva and shed skin cells to develop a genetic fingerprint—assumed to be from the robbers. Unfortunately, to positively identify a suspect, a known sample of DNA is needed for comparison, and the police had no suspects.

- A break in the case seemed to come a few months later, when some of the stolen bank checks surfaced. Police traced the checks to two men, but they weren't the original bank robbers, and the trail from them led nowhere. The case went cold, although the two DNA profiles were entered in Victoria's new DNA database in 1999.
- In 2000, in a rural area outside Melbourne, police tried to pull a driver over because the numbers on his license plate were only partly visible. Rather than slowing down, the driver led the police on a high-speed chase that finally ended in the parking lot of a Melbourne shopping mall, where he was caught by security guards.
- Police arrested 35-year old Goran Stamenkovic, who was tried and convicted for a number of offenses and sentenced to four years in prison. During Stamenkovic's incarceration, he was required to submit a DNA sample for the forensic database, which was found to match the genetic profile from the bank heist eight years earlier. Investigators reanalyzed the original stored evidence and again found a match for Stamenkovic.
- Detectives tried to bargain with Stamenkovic to give up his partner in the bank heist, but he wouldn't cooperate. In a stroke of luck, just a couple of months later, 43-year-old Mikael Mann was arrested for the armed robbery of a woman in her Melbourne apartment. Mann's DNA sample was taken almost immediately and found to be a match for the second bandit in the Melbourne robbery. In 2007, both men were sentenced to seven years for the crime.

Suggested Reading

Dillow and Rehder, *Where the Money Is*.

Dinsio, *Inside the Vault*.

Primorac and Schanfield, eds., *Forensic DNA Applications*.

Questions to Consider

1. Why do you suppose many people enjoy crime stories, such as those of the great bank heists in this lecture, and some people even root for the “bad guys”?
2. How have bank robberies changed over time? What kinds of security measures have been developed to thwart them?

How Reliable Is Eyewitness Testimony?

Lecture 13

Jennifer Thompson and Ronald Cotton are two national experts who work on exposing the dangers of eyewitness testimony in police and judicial processes. Their work helps to demonstrate how misidentification can lead to miscarriages of justice in the U.S. court system. These two authorities acquired their expertise on this topic in a case in which they were both involved—on opposite sides. Jennifer Thompson was raped in 1984 and, later, picked Ronald Cotton out of a police lineup as her attacker. Thompson's testimony against Cotton sent him to prison for more than 10 years, even though he was not her rapist. It's almost impossible to imagine that today, the two are close friends and colleagues.

The Attack and Examination

- In July 1984, in Burlington, North Carolina, 22-year-old college student Jennifer Thompson was raped in her apartment by a man who had broken in while she was asleep. During the attack, Thompson had the presence of mind to study her rapist so that she would be able to identify him later. Afterwards, she managed to run from her apartment to a stranger's home nearby and call the police.
- Thompson was taken to the hospital so that she could be examined and a rape kit could be taken. The rape kit procedure involves collecting physical evidence that may be present on a victim's body. Investigators—often, forensic nurse examiners—swab body parts for saliva or semen and collect hairs or fibers that might be from the perpetrator.
- While Thompson was in the emergency room, she heard that another rape victim was also in the hospital—a woman named Elizabeth—who might have been attacked by the same man after he left Thompson's apartment. Elizabeth lived only a half mile from Thompson.

- The next stop was the police station. There, Thompson worked with a police identification kit, selecting facial and other features to be put into a composite drawing. Thompson was also questioned about the rape and the physical examination at the hospital. Because officers believed that the initial examination had not been performed correctly, they sent Thompson to another hospital to have the rape kit redone.

Thompson's Identification

- The sketch made from Thompson's description was released to the public through the media. Based on an anonymous tip, police rounded up Ronald Cotton, a 22-year-old man who resembled the description and worked near the area where the two young women had been raped.
 - Cotton had a breaking-and-entering charge on his record, as well as an attempted sexual assault charge from his teenage years, for which he served 18 months.
 - Cotton's alibi for the night of the rapes was quickly shown to be inaccurate. In his defense, Cotton claimed that he had confused a couple of days of the past week.
- When police brought Thompson six photographs of possible suspects, they told her that her rapist might or might not be among them. That's an important part of police lineup procedure because it doesn't force the witness to make a choice.
 - One of the problems with the police photo presentation, however, was that Thompson was given all six images at the same time. That method allows the witness to compare each face against the others and use a process of elimination to exclude individuals, rather than simply positively identifying one perpetrator.
 - In fact, Thompson herself later said that she treated the photo array like a standardized test question: She compared the features of each man against the others, excluding those she

was sure were not right, and settled on Cotton as the “best fit” for her rapist.

- Cotton was later one of seven similar-aged African American males brought into the police station for Thompson to observe. Each man was asked to step forward and repeat a few sentences that Thompson remembered from the rape. Although she later admitted that she almost picked another man in the lineup, Thompson ultimately selected Cotton. When police told Thompson that she had picked the same man as in the photo array, she was convinced that she had identified the man who raped her.

Trial and Retrial

- In 1985, Cotton was brought to trial, charged with rape and burglary. The prosecution presented police testimony about his false alibi and physical evidence, including a flashlight found at Cotton’s house that was alleged to be similar to one used in the rape and a small piece of foam rubber found at the scene that was consistent with the inside of a pair of sneakers owned by Cotton. After Thompson pointed to Cotton in the courtroom and stated that he was her rapist, it took a jury just 40 minutes to find him guilty of both rape and burglary, for which he was sentenced to life in prison.
- Eyewitness testimony is considered direct evidence because it involves a person testifying to what he or she directly saw, heard, felt, and so on. Perhaps surprisingly, tangible physical evidence—such as hair, fibers, fingerprints, and even DNA—is considered indirect evidence because the judge or a jury must make inferences based on that evidence. Eyewitness testimony, if true, is a statement of fact with no interpretation necessary. Of course, as we all know, people can make mistakes or even lie on the witness stand.
- Once Cotton was incarcerated, he began writing to attorneys and the media, trying to convince them of his innocence. About a year after he entered prison, a new inmate arrived, Bobby Poole. Cotton later heard from another prisoner that Poole had admitted to the rape of Thompson and another woman in July 1984, as well as other rapes

since that time. Poole even joked to fellow inmates that Cotton was doing some of his jail time for him.

- Cotton soon earned a new trial, although not because of the information about Poole. It had been revealed that the second rape victim on the same night as Thompson had picked a different man in the police lineup, but that evidence had been withheld during Cotton's original trial. By this time, however, the second victim, Elizabeth, had concluded that Cotton was her rapist, too. Thus, at his second trial, Cotton was charged with two rapes.
- Elizabeth testified—although less convincingly than Thompson—that Cotton was the rapist. Poole was brought into the courtroom, but Thompson stuck to her identification of Cotton. At the end of the trial, Cotton was convicted of two counts of rape and two counts of burglary, for which he was given two life sentences.

Release and Forgiveness

- In 1994, after seven years in prison, Cotton learned about DNA testing in forensic cases. Richard Rosen, an attorney and law professor, agreed to help him pursue DNA testing but warned him that if the DNA evidence identified Cotton as the rapist, there would be no other legal means to get him out of prison. Cotton insisted that the test be done.
- Much of the evidence in the two 1984 rape kits had degraded over the course of 10 years, but in Elizabeth's rape kit, a fragment of a single sperm cell was found. That tiny bit of evidence yielded a DNA profile that proved Cotton was not the rapist and Poole was. Cotton was exonerated and released in June of 1995. Poole died in 2001 while still incarcerated.
- When she heard the news of Cotton's innocence, Thompson felt tremendous guilt and shame. She wondered if people thought she had reacted too quickly after the crime and had just tried to identify any man to pay for what happened to her. She also speculated that

people might think of her as a racist, given that she is white and Cotton is black.

- About two years after Cotton's release, Thompson asked if he would meet with her. Thompson burst into tears and apologized to Cotton, who told her that he just wanted them both to be happy and to move on with their lives. The pair hugged and promised to stay in touch.

Lessons from the Case

- It has long been known that eyewitness testimony is problematic. Many scientists, probably most famously forensic psychologist Elizabeth Loftus, have extensively studied the phenomenon.
 - One interesting facet of the issue is that people tend to differentiate the faces of people from their own race better than they can distinguish among the faces of people from other races.



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Eyewitness testimony is valuable in criminal cases, but law enforcement officers, investigators, attorneys, juries, and judges should also be aware that it can be faulty.

- Loftus thinks that when an individual sees a person of a different race, the primary things noticed may be the stereotypical characteristics associated with that race. For instance, a Caucasian might note eye shape and hair form in Asians rather than other details. During a lineup, when multiple people from that race are presented together, we can't differentiate because we never focused on the finer details in the first place.
- It's also known that human memory is malleable. As we ponder something that happened or try to recall someone we saw, our minds can easily distort the details, especially if new information becomes available. We may begin to confuse or blend the original story or image with the new data. Experts have also noted that a witness who at first may be uncertain can often become more certain over time. It's as if we want so badly to be sure that we subconsciously force ourselves to become more confident in our assertions.
- Since the time Cotton gained his freedom, several hundred people have been exonerated through DNA testing; about three-fourths of them were convicted partly by faulty eyewitness identification, making it the most common source of wrongful convictions in the legal system.
- To atone for the error that cost Cotton more than 10 years of freedom, Thompson has devoted her life to talking about the mistake she made. She regularly speaks at conferences to educate those involved in the legal system of the pitfalls of convictions based solely or too heavily on eyewitness testimony. She also opposes the death penalty because of the possibility of wrongful executions.
- Through their story and activism, Thompson and Cotton have lobbied for reform in police procedures, especially those involving eyewitness identifications. Their efforts and their book, *Picking Cotton*, have helped prompt procedural reform in some parts of the country, but many agencies still resist change.

- After being released from prison, Cotton got a job with the DNA testing company that performed the analysis that earned his exoneration, and the state of North Carolina awarded him \$110,000 in restitution. Cotton married, had a daughter, and to this day, remains friends with Thompson and her family.

Suggested Reading

Borchart, *Convicting the Innocent*.

Innocence Project, <http://www.innocenceproject.org/>.

Loftus, *Eyewitness Testimony*.

Loftus and Ketcham, *Witness for the Defense*.

Münsterberg and Hatala, *On the Witness Stand*.

Murray, *Overturning Wrongful Convictions*.

Petro and Petro, *False Justice*.

Primorac and Schanfield, eds., *Forensic DNA Applications*.

Scheck, Neufeld, and Dwyer, *Actual Innocence*.

Thompson-Cannino and Cotton, *Picking Cotton*.

Questions to Consider

1. Do you have any experience being an eyewitness to a crime or some other important incident? If so, how confident did you feel regarding your account?
2. What kinds of things contribute to faulty memories when trying to recall events or people?
3. Can you think of ways by which a person can be led to “recall” something that he or she didn’t actually experience or previously remember?

The Truth behind False Confessions

Lecture 14

Marty Tankleff served 17 years behind bars for the murders of his parents based on a false confession—one that Tankleff never wrote or signed. It may seem nearly impossible, but Tankleff's story is just one of far too many, especially in cases involving juvenile suspects or people who are mentally incapacitated. Corrupt or simply overzealous law enforcement officers, misleading interrogation methods, and false technology have been used to dupe naïve people into confessing to crimes they didn't commit. In this lecture, we'll look at several cases of false confessions and the personal tragedies that result.

Murder in Suffolk County

- In early September 1988, at 6:15 a.m., 17-year-old Marty Tankleff called 911 in Suffolk County, New York. He had found his 62-year-old father, Seymour, on the floor in the den of the family's home, bludgeoned and bleeding from a slash in his throat. Marty discovered his 54-year-old mother, Arlene, dead in the master bedroom, also beaten and with her throat cut. The teenager tried to keep his unconscious father alive while he waited for an ambulance.
- When a police officer arrived, Marty said that he had gone to bed about 11:00 the night before, while his parents were hosting friends for a poker game. Marty, the couple's adopted son, was the only other person who lived in the house. Mr. Tankleff had recently sold a successful insurance business and invested the proceeds in several bagel stores and a gym.
- The crime scene investigation produced little evidence. Police believed that Mr. Tankleff had been hit over the head while sitting at his desk, then attacked with a kitchen knife, although no weapon was found. The lead detective, Jim McCready, took Marty to the police station to gather more information.

Marty's "Confession"

- After four hours of intense questioning, officers arrested Marty Tankleff for the murder of his mother and the critical injuries to his father. According to McCready, Marty had admitted his guilt. But the confession was in the detective's handwriting, and the young man steadfastly denied admitting the crime.
- In fact, Marty told police that he believed a man named Jerry Steuerman was responsible. Steuerman was a disgruntled business associate who owed Seymour Tankleff \$500,000. He had been at the poker game the night before and was the last guest in the house.
- According to Marty, McCready told him that Mr. Tankleff had regained consciousness at the hospital and identified his son as his attacker. The detective also told Marty that some of his hair had been discovered in his mother's hand and that tests had shown Marty had washed off blood in the shower. McCready explained to Marty that people sometimes block out horrible incidents from their minds. Marty began to question his own sanity, wondering if he could have attacked his parent in some altered state of mind.
- At that point, McCready read Marty his Miranda rights and wrote out the confession. Although Marty was confused, he refused to sign. Seymour Tankleff never regained consciousness and died from his injuries about a month later. McCready had fabricated the story about his identification of Marty.
- Within a week of the attack, Steuerman took \$15,000 out of a business bank account he had shared with Tankleff. He then assumed a false identity and left New York for California. Nevertheless, Suffolk County Police never seriously investigated Steuerman, perhaps because of alleged payoffs related to earlier illegal activity. McCready later located Steuerman and brought him back to New York but refused to connect him with the deaths of Seymour and Arlene Tankleff.

Trial and Conviction

- At trial in 1990, McCready indicated that he first became suspicious of Marty because the teenager seemed devoid of emotion at the crime scene. But Marty said that he had been taught by his father to put emotions aside in tense situations in order to deal effectively with the problem at hand. Since the original questioning, Marty had passed two polygraph tests, and he believed that the jury would realize he had not committed the murders.
- There was no forensic evidence linking Marty to this crime, and forensic testing found no blood evidence on either the barbell or the kitchen knife that were listed as weapons in the fabricated confession. Further, Arlene Tankleff had been so fearful of Steuerman that she had written down specific threats he had made. Nevertheless, Marty was found guilty of murdering both his parents and sentenced to 50 years to life in prison.
- During this same time, the New York State Commission of Investigation issued a report about rampant corruption in the Suffolk County Police, and it was discovered that McCready had perjured himself in an earlier murder trial.

New Evidence and Appeal

- In prison, Marty contacted organizations that help exonerate those who are falsely accused. By 2001, a retired New York homicide detective, Jay Salpeter, agreed to help Marty. Salpeter found new witnesses and evidence that pointed to Steuerman as having arranged the murders. Salpeter even located eyewitnesses who could testify to seeing Steuerman and McCready together on several occasions before the murders, despite McCready's claims that he had never met Steuerman before the Tankleffs were killed.
- All this new evidence and dozens of witnesses who were willing to testify against Steuerman were presented at Suffolk County evidentiary hearings in 2006. Presiding at those hearings was District Attorney Thomas Spota, who had represented McCready on

two other legal issues. Needless to say, Marty's attorneys did not win the motion for a new trial.

- Marty's appeals finally reached the New York Supreme Court; in December of 2007, the 36-year-old Tankleff's conviction was unanimously overturned, and he was awarded a new trial in Suffolk County. However, based on allegations of corruption in Suffolk County and lack of evidence in the case, Attorney General Andrew Cuomo announced in June of 2008 that the state would not retry Tankleff.

The Confession of Michael Crowe

- In 1998, 12-year-old Stephanie Crowe was stabbed to death in her Escondido, California, bedroom, with no signs of forced entry into the house. After 11 hours of coercive interrogation, police convinced her 14-year-old brother, Michael, that he had killed his younger sister, though he had not.
 - Investigators used a piece of bogus technology—a *computer voice stress analyzer*—to trick Michael by saying that the machine showed he was lying.
 - This instrument was developed specifically for interrogation purposes and is not based on any scientific evidence.
- According to Richard Leo, an expert in coerced confession, a video recording reveals Michael's interrogation to be nothing more than "psychological torture." Police told Michael's parents that their son had been taken into grief counseling.
- Luckily, the truth about Stephanie's murder ultimately came out: A 28-year-old mentally ill homeless man had been seen wandering the Crowes' neighborhood on the day of Stephanie's murder. On the morning after the murder, police picked the man up for questioning and found blood on his clothes. DNA testing later showed that the blood was from Stephanie Crowe.

- Amazingly, the Escondido police and prosecutor's office didn't pursue the case against the homeless man because they didn't want to face public scrutiny for their error. The California Department of Justice prosecuted the case in 2004. In 2011, the Crowe family was awarded more than \$7 million in damages.

Christopher Ochoa and Richard Danziger

- In 1988, 22-year-old Christopher Ochoa was brought in by the police for questioning in the rape and brutal killing of the 20-year-old female manager of a pizza restaurant in Austin, Texas. Ochoa and his friend and roommate, Richard Danziger, worked at another franchise of the same pizza chain in Austin. When the pair visited the restaurant where the murder had taken place and talked to the security guard posted there, police began to suspect that they had something to do with the crime.
- Over the course of two days, Ochoa was subjected to a brutal interrogation. Officers screamed at him, threatened him with the death penalty, and warned that he would be raped in prison. Ochoa claims that he asked for an attorney early on, but that request was denied. Although much of the interrogation was audio recorded, there were repeated stops and starts in the recording, as well as three hours of missing tape.
- Police called Ochoa's mother and told her that she should convince her son to plead guilty or he would die. Ochoa's mother was ill and, in fact, suffered a stroke that her son believes was related to the pressure surrounding the situation. Ultimately, Ochoa signed a confession.
- In 1989, Ochoa was sentenced to life in prison for the crime, as was Richard Danziger. Eight years later, another prisoner contacted numerous authorities, claiming that he had been the killer in the pizza restaurant. Eventually, Austin investigators questioned Ochoa further about the crime, but Ochoa believed that recanting his confession at that point would stall his chances of parole.

- By 1999, Ochoa decided to contact the University of Wisconsin's Innocence Project. Once again, DNA evidence from the victim was still in storage, and testing proved that the semen from the case belonged to neither Ochoa nor Danziger.
- Exonerated in 2001, Ochoa has since graduated from the University of Wisconsin law school. Unfortunately, while in prison, Danziger received a vicious beating from a fellow inmate that resulted in permanent brain damage. Although Danziger is also a free man, he still requires full-time care.

Eddie Joe Lloyd and the Innocence Project

- Problems also arise with confessions when authorities interrogate persons of diminished mental capacity. In 1984, while being held in the Detroit Psychiatric Institute, a man named Eddie Joe Lloyd wrote to police that he had supernatural abilities that would help solve crimes. Police questioned Lloyd without an attorney present, and he ultimately confessed to killing a 16-year-old girl. His confession clearly shows that police fed him details about the crime that he could not have known.
- In addition to police injustices, Lloyd's case was also affected by legal malpractice. In 1985, his first court-appointed attorney withdrew from the case about a week before trial, leaving Lloyd's second attorney little time to prepare. The second attorney called no witnesses in defense of his client—not



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Some people who sign confessions to end an interrogation do so with the belief that science and the law will sort things out later, never dreaming that may not happen for decades.

even someone to attest to Lloyd's mental health history—and did not cross-examine critical witnesses. After less than an hour of jury deliberation, Lloyd was convicted of felony murder.

- After the Innocence Project in New York took on the case, DNA evidence exonerated Lloyd, who was set free after 17 years in prison. Unfortunately, he died 2 years later. His estate was awarded \$4 million from Wayne County, Michigan.

Suggested Reading

Borchart, *Convicting the Innocent*.

Firstman and Salpeter, *A Criminal Injustice*.

Innocence Project, <http://www.innocenceproject.org/>.

Münsterberg and Hatala, *On the Witness Stand*.

Murray, *Overturning Wrongful Convictions*.

Petro and Petro, *False Justice*.

Primorac and Schanfield, eds., *Forensic DNA Applications*.

Scheck, Neufeld, and Dwyer, *Actual Innocence*.

Questions to Consider

1. At what age do you think young people should be permitted to be questioned without their parents present?
2. Were you surprised to learn how common false confessions are in criminal cases? Why or why not?
3. Do you think you could or should refuse a police officer's request to search your vehicle or personal possessions if you had done nothing wrong?

Crooked Cops and Bad Convictions

Lecture 15

On June 22, 1970, a New Zealand man named Len Demler reported that his daughter, Jeanette Crewe, and her husband, Harvey Crewe, were missing from the couple's home. Demler had found the house covered in blood spatter but discovered his 18-month-old granddaughter, Rochelle, crying in her crib. The child had clearly been taken care of, for at least several days, at a crime scene that was estimated to be about five days old. In this lecture, we'll analyze the investigation of this puzzling crime in New Zealand and look at two other tragic cases involving wrongdoing on the part of police.

The Crewe Murders

- After Len Demler's discovery that his daughter and son-in-law were missing in June of 1970, neighbors of the couple reported hearing several gunshots five nights earlier. The witnesses also described other strange occurrences in the five days preceding the discovery: They had seen a woman at the Crewes' farm on several occasions and had witnessed Rochelle, the couple's 18-month-old daughter, running in the yard just two days before she was found alone in the house by her grandfather.
- At the house, there was no sign of forced entry or struggle, but evidence suggested that two people had lost extensive amounts of blood in the living room, one in a chair and the other on the floor in front of the fireplace. A pathologist noted that the blood loss was enough to have resulted in the death of both victims.
- Two months later, in a nearby river, Jeannette's body was discovered wrapped in a bedspread and bound by copper wire. Harvey's body was found upstream about a month after that, also trussed in wire and having apparently been weighted down by a car axle. Autopsies determined that both victims had been shot with a .22-caliber rifle, and Jeanette's facial bones were fractured, as were six of her teeth.

- So much of Harvey's blood was found on his easy chair that investigators assumed he had been shot first. Jeannette was probably hit in the face with the butt of the rifle when she tried to defend herself or come to Harvey's aid. Then, she was shot as she lay incapacitated on the floor in front of the fireplace.
- Although they did not initially find any ballistic evidence at the scene, police collected more than 60 rifles from homes in the area for comparison with the type of gun they suspected had killed the couple. About four months after the crime, a .22 cartridge case was discovered in the yard, and investigators determined that it had been shot from a rifle previously collected from one of the Crewes' neighbors, Arthur Thomas.
- Later, a detective named Johnston received an anonymous tip to search Thomas's farm, where he was told he might find evidence related to the axle used to weight down Harvey Crewe's body. Johnston searched the property and found a part that matched the axle type. Thomas was arrested in 1970 and convicted in 1971, based on the cartridge casing found in the Crewes' garden and the axle piece found on his property.
- Despite the evidence, Thomas's conviction led to an outcry by friends, relatives, and the media; Thomas had no motive and was known in the community as a good man. Mrs. Thomas said that her husband was home with her on the evening of the killings, but she was suspected of being the woman who took care of the baby after the Crewe couple was murdered. Thomas was granted a retrial, but in 1973, he was convicted for a second time.
- A number of public and private individuals became further involved in the effort to get Thomas exonerated. Ultimately, forensic scientist Dr. Jim Sprott was enlisted to reexamine the cartridge casing found at the scene. He determined that the casing had not been exposed to the elements for more than four months and believed that it had been planted at the scene.

- Based on Dr. Sprott's conclusions and other statements that had come to light, a Royal Commission of Inquiry reversed Thomas's conviction in 1980 and agreed that two specific investigators, Len Johnston and Bruce Hutton, had likely been involved in planting the cartridge casing. But the officers were never tried because the solicitor-general claimed to have insufficient evidence. Thomas was released from jail in December of 1979.



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Supporting the theory that the shell casing had been planted at the Crewe crime scene was the fact that the area had been extensively searched two times before the casing was found.

Unanswered Questions

- Ian Wishart, author of a 2010 book about the Crewe case, paints Johnston as both the killer and the one who planted the evidence. Wishart's theory includes the fact that Johnston had investigated a burglary at the Crewe house in 1967 and, thus, would have known the couple, the layout of the house, and possibly, the hiding place for a spare house key.
- Wishart and other sources note that in the three years between the 1967 burglary and the 1970 killings, there were two arson attempts at the Crewe farm. It has also been alleged that the brake line in Jeannette's car was cut in 1969, but Jeannette did not report the incident to police. One suspicion arising from these incidents is that Johnston was stalking Jeannette. A second theory is that he was blackmailing the couple because he suspected the 1967 burglary was a scheme to defraud the Crewes' insurance company.
- A book released in 2012 by reporter Chris Birt exposes more possible evidence related to the framing of Arthur Thomas and its

subsequent cover-up. Birt claims that Johnston was undoubtedly the killer, but in an earlier book, he had identified Jeannette's father, Len, as the murderer.

- Of course, another major unanswered question is: Who cared for Rochelle after her parents had been killed? As mentioned earlier, Thomas's wife was initially suspected of being the caregiver. Some have suggested that it was Jeannette Crewe, who had murdered her husband, then killed herself by the river five days later. Other sources claim that Len Demler was the killer and that other members of Jeannette's family took care of the baby. To this day, the mysterious caregiver remains unidentified.

Abner Louima

- In 1997, a Haitian immigrant named Abner Louima was tortured while in police custody in Brooklyn, New York. The perpetrator of the assault, an officer named Justin Volpe, ultimately admitted guilt and, in 1999, was sentenced to 30 years in prison without parole. Three other officers were originally sentenced to 5 years each for trying to cover up the incident, but their convictions were later reversed for lack of evidence. Those reversals have led many to argue that justice has not been served.
- The incident began when Louima was taken into custody during a brawl outside a New York nightclub. At the police station, he was tortured and sodomized by Officer Volpe. His internal injuries were so severe that he had to be taken to a local hospital, where Volpe claimed that his prisoner's injuries were from the nightclub fight. Later, a nurse called the authorities to report her suspicions that police were responsible for Louima's injuries.
- Volpe later admitted torturing Louima at the precinct. In July of 2001, Louima was awarded \$8.75 million in damages by the New York Police Department; Volpe won't be eligible for release until 2025.

The Cerro Maravilla Massacre

- On the night of July 25, 1978, in Puerto Rico, three young men planned to sabotage some of the broadcast towers that are planted along Cerro Maravilla, the island's fourth highest summit. Their act was to be in retaliation for the U.S. government's continued imprisonment of two groups of Puerto Rican militants. The three men were Carlos Soto Arriví, Arnaldo Darío Rosado, and Alejandro Gonzalez Malavé.
- Arriví and Rosado were longtime members of a separatist group called the Armed Revolutionary Movement, known in Spanish known as MIRA. On the evening of July 25, they, along with Malavé, hijacked a taxi and ordered the driver to take them to the Maravilla broadcast towers. But when they reached the peak, they were ambushed by waiting police. The police reported that they ordered the men to surrender, but the revolutionaries fired first, and Arriví and Rosado were killed. The third man, Malavé, was only slightly wounded.
- During an interview with reporters two days later, the taxi driver said that the three men had tried to surrender to the officers and that Malavé had called out, "Don't shoot; I'm an agent." In fact, Malavé was an undercover police officer who had been assigned to infiltrate MIRA. Malavé was the one who had told the authorities about the revolutionaries' plan.
- When the news was first released, the governor of Puerto Rico, Carlos Romero Barceló, commended the police for preventing a terrorist attack by revolutionaries, and no charges were filed against any officers. But as the media began to circulate the taxi driver's conflicting stories, Barceló was pressured to investigate further. The driver's expanded story was that he had seen Arriví and Rosado being beaten by police in front of the cab.
- The opposition parties of Puerto Rico and members of the public continued to press for further investigation, claiming that the events on the mountain had been a setup. Between 1978 and 1980, both the

FBI and the U.S. Department of Justice looked into the matter and concurred with the official conclusions about the case: The incident was not a deliberate massacre of the freedom fighters.

- But in 1981, the Judiciary Committee of the senate of Puerto Rico reopened the case, granting immunity to certain police officers who had been at the scene in exchange for their testimony. Ultimately, testimony revealed that Arriví and Rosado had been dragged from the cab and beaten after an initial round of gunfire, then executed by the police.
- This evidence led to the conviction of 10 police officers on charges of perjury, obstruction of justice, and destruction of evidence. Four of the officers were also convicted of second-degree murder. The second round of investigations did not, however, confirm a cover-up by the Puerto Rican or U.S. governments, although such allegations were certainly made.
- Malavé was dismissed from the force because of public pressure, then later given immunity to testify against the officers who shot Arriví and Rosado. On April 29, 1986, he was assassinated in front of his mother's house; a group called the Volunteer Organization for the Revolution claimed responsibility.
- Fourteen years after the incident, the head of the Justice Department's Civil Rights Division during the investigation issued a public apology for what he thought had been a cover-up by the FBI in the case. Twenty-five years after the killings, former Governor Barceló stated that he acted prematurely in praising the officers involved in the incident, but he still admits nothing with regard to a cover-up. Pro-independence followers still convene on the mountain every year on July 25 to mark the anniversary and celebrate the Independentista movement.

Suggested Reading

Borchart, *Convicting the Innocent*.

Münsterberg and Hatala, *On the Witness Stand*.

Murray, *Overturning Wrongful Convictions*.

Nelson, *Murder under Two Flags*.

Petro and Petro, *False Justice*.

Scheck, Neufeld, and Dwyer, *Actual Innocence*.

Questions to Consider

1. What kinds of mistakes can police officers make, unintentionally (not maliciously), when honing in on alleged suspects?
2. What are some of the issues you believe contribute to police misconduct? How rampant—or not—do you believe the problem is?

Guilty until Proven Innocent

Lecture 16

Joyce Gilchrist worked for the Oklahoma City Police Department for about 20 years. During that time, she became well known for her uncanny ability to make connections between evidence and perpetrators. Her contributions to cases and trials sent thousands of people to prison, with 23 of those individuals ultimately sentenced to death. Tragically, 11 of those people had already been executed by the time an FBI review of Gilchrist's work demonstrated her incompetence and deception. In this lecture, we'll look at how human error, bias, or wrongdoing can subvert even the most sophisticated forensic tools.

Misuse of Science: Joyce Gilchrist

- Forensic scientist Joyce Gilchrist worked in several capacities in the Oklahoma City forensic lab, including as an analyst of trace evidence and in forensic chemistry. She performed hair analysis, fiber examinations, and chemical and serological testing of body fluids, among other procedures.
- Sometime in 2001, a secret FBI review of Gilchrist's work was conducted. Investigators found that in five of eight cases reviewed, she had either made serious mistakes or gone beyond the "acceptable limits of forensic science."
 - One of the problems with analysis of such evidence as hair, fiber, and blood is that it can narrow down identification only to a relatively large category, not to a particular individual. For example, although there are different hair forms and colors, a tremendous number of people share the same patterns.
 - Gilchrist used hairs, fibers, and blood to place suspects at crime scenes with a confidence that was scientifically unwarranted. Other accusations of Gilchrist's malpractice included not performing tests that might demonstrate a suspect's innocence

and withholding evidence from the defense that would help counter the prosecution's case.

The Case of Robert Lee Miller Jr.

- In 1986, two elderly women were raped and murdered in the same neighborhood in Oklahoma City. A man named Robert Lee Miller Jr. was convicted of the two murders, largely owing to Gilchrist's testimony, and sentenced to death. Ten years later, DNA evidence proved conclusively that Miller was not guilty. At the time of Miller's trial, DNA technology was not commonly used in forensics and was not accepted in Oklahoma courts, although serological testing was already providing some genetic information.
- Evidence collected from the crime scenes included semen, blood, saliva, and hair. The perpetrator was determined to be blood type A and a *secretor*, that is, an individual who expresses blood type markers in other body fluids, such as semen and saliva. The blood also contained a genetic marker that at the time was said to be more common in African Americans than people from other ancestries.
- Ultimately, police focused on Robert Miller as the prime suspect. Miller endured a 12-hour interview—despite the suspicion that he was high on drugs at the time—and gave a false confession. Miller's trial hinged largely on that coerced confession, combined with extensive testimony from Gilchrist about blood, saliva, and hair.
- Gilchrist correctly testified that she could not exclude Miller as being the murderer because he had type A blood. Although crime scene body fluid testing revealed four genetic markers that were not present in Miller's blood, Gilchrist claimed that those discrepancies did not exclude Miller because the crime scene samples could have been tainted by the victim's blood—even though the victim was not type A.
- Gilchrist's analyses were also said to exclude another suspect, Ronald Lott. DNA testing later proved that Lott was the rapist and

murderer, and he was convicted in 2002. Lott is now on death row, while Miller finally walks free after 10 years in prison.

- Gilchrist was fired, and thousands of cases in which she was involved have been reevaluated. Former inmates are now suing her for her part in their wrongful convictions. Sadly, some of them—executed after Gilchrist’s analysis and testimony—never lived to see justice served.

The Madrid Train Bombings

- On March 11, 2004, in and around Madrid, Spain, 10 bombs detonated almost simultaneously on four trains during morning rush hour. In one of the worst acts of terror in Europe since World War II, 191 people were killed and nearly 2,000 were injured. Investigators fairly quickly discovered that the bombs had been packed in backpacks and detonated by mobile phones.
- Because the incident occurred three days before Spain’s general election, the attack was originally thought to be the work of a Basque separatist organization, but suspicions quickly turned toward al-Qaeda.
- A few weeks after the bombings, the Spanish National Police closed in on an apartment in west Madrid to make an arrest. But suspects in the building detonated a suicide bomb, killing 7 of themselves and 1 policeman and wounding another 11 officers. Some of the suspects fled the scene. Spanish authorities determined that the explosives used at the apartment were of the same type as the devices used in the train bombings.
- Although authorities had intelligence about the group responsible, they initially didn’t have much physical evidence to definitively link the crimes to specific individuals. But while investigating around the scene of the train bombings, Spanish police had recovered a blue plastic bag. It contained seven copper detonating devices and had a single usable fingerprint on its surface.

Suspect: Brandon Mayfield

- More than 5,000 miles away, just outside Portland, Oregon, a 37-year-old attorney named Brandon Mayfield and his wife, Mona, began to notice some strange happenings around their home. When they'd return to the home after being gone for a time, things seemed slightly out of place. They suspected a possible burglary, but nothing was missing.
- Brandon Mayfield was born in Oregon in 1966. At age 20, he met his future wife, Mona. She was an Egyptian national and a Muslim, and as their relationship proceeded, Brandon converted to Islam. When he met Mona, Mayfield was already in the U.S. Army Reserve. In 1992, he joined the U.S. Army and was an officer until 1994; he earned a law degree in 1999.
- In addition to his family law practice, Mayfield worked for an Oregon State Bar Association organization dedicated to helping clients who couldn't afford legal representation. In 2003, he represented a man named Jeffrey Battle in a child custody matter. Battle was one of a group of American Muslims known as the Portland Seven who had been convicted of conspiring against the United States with the Afghani Taliban Islamic fundamentalist movement.

Surveillance and Arrest

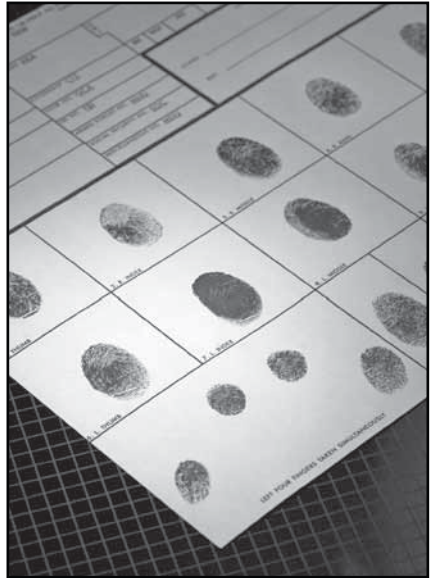
- The Spanish National Police requested that the FBI run the fingerprint found on the bag of detonating devices through its Integrated Automated Fingerprint Identification System (IAFIS)—a database of digitized fingerprint records. On March 19, 2004, eight days after the Madrid train bombing, the FBI's Latent Print Unit identified Brandon Mayfield as the source of the fingerprint. The print was labeled latent fingerprint (LFP) 17.
- In actuality, the IAFIS search had generated a list of 15 to 20 most likely candidates, of which Mayfield was one. The results generated by IAFIS are not definitive; any system-suggested matches are always followed up with a comparison by a qualified fingerprint

examiner. In the Mayfield case, three FBI examiners concluded that Mayfield was the source of the print.

- As its legal authority to begin surveillance of Mayfield and conduct clandestine searches of his residence and law office, the FBI used the Foreign Intelligence Surveillance Act (FISA) of 1978. Further justification came from the USA Patriot Act of 2001. The FBI obtained a “sneak and peek” warrant for Mayfield’s home and office, which allowed agents to copy computer hard drives, install sound-monitoring devices, and gather bank records.
- Within about three weeks of identifying the print as Mayfield’s, the FBI was contacted by the Spanish National Police, who had determined that the print was “conclusively negative” as a match to Mayfield. Nevertheless, an arrest warrant was issued for Mayfield. In addition to the fingerprint, the attorney’s regular attendance at a local mosque and other personal and professional activities may have been considered as evidence by the FBI. Mayfield was arrested on May 6, 2004.
- In the affidavit used as justification for the search and arrest, the FBI stated that the identification of the fingerprint was 100 percent positive and that the Spanish National Police was satisfied with the FBI’s conclusion. At his hearing, Mayfield produced his expired passport to show that he hadn’t been out of the country, as well as witnesses who accounted for his whereabouts around the time of the bombing in Spain.
- After further investigation of the fingerprint, on May 19, Spanish authorities arrested an Algerian named Daoud, who not only was a definitive match to the print but was also linked in other ways to the bombings. Once Spain issued an arrest warrant for Daoud, U.S. authorities dismissed Mayfield’s case and released the attorney from jail without charges.

Fallout from the Case

- In March 2006, a 273-page report was released by the office of Inspector General (IG) Glenn Fine regarding the misidentification of Mayfield. The IG's office acknowledged that there were similarities between the latent print found near the crime scene in Spain and Mayfield's fingerprint but concluded that the FBI, in identifying a match, may have been over-reliant on its own expertise and overconfident in IAFIS.
- The IG also speculated whether Mayfield's religion had played a part in the misidentification. The report concluded that at the time of their examination, FBI fingerprint experts were not aware that Mayfield was Muslim, was married to a Middle Eastern woman, or had legally represented a member of the Portland Seven terrorist cell. But the issue wasn't as clear with regard to the rest of the FBI's investigation.
- The IG's report noted that the latent print examiners ignored a full quadrant in the unknown print that did not match Mayfield's pattern. According to the report, the multiple alternative theories the FBI had to construct to conclude that LFP 17 belonged to Mayfield rose to such a level of unlikelihood that the potential match should have been dismissed.



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A fingerprint match must be 100 percent certain; any discrepancy that can't be explained away by the examiner is grounds for exclusion.

- The report further argued that once the examiners thought the print belonged to Mayfield, they began to work backward, using Mayfield's clear print to look for similarities in the questioned print.
- The IG's report recommended several changes to FBI laboratory procedures with regard to fingerprint identification but found no misconduct on the part of FBI employees. To its credit, the FBI had already implemented changes in its practices.
- In 2004, Mayfield filed a lawsuit against the U.S. Department of Justice, the FBI, and several specific FBI employees for violations of his civil rights. Mayfield won his suit and was subsequently awarded \$2 million.

Suggested Reading

Borchart, *Convicting the Innocent*.

Murray, *Overturning Wrongful Convictions*.

Petro and Petro, *False Justice*.

Scheck, Neufeld, and Dwyer, *Actual Innocence*.

U.S. Department of Justice, National Institute of Justice, *Latent Print Examination and Human Factors*.

Questions to Consider

1. Were you aware of the Gilchrist malpractice case? What safeguards do forensic scientists have in place to prevent mistakes in analyzing evidence? What safeguards should be in place?
2. What are some of the major causes of false convictions in the U.S. legal system?

3. What are some other possible lines of forensic evidence to seek truth in false convictions in cases where DNA testing is not possible, such as a drive-by shooting or a case of mistaken identity?

Political Assassinations

Lecture 17

In this lecture, we'll look at some cases from around the world that involve the intersection of political intrigue and forensic science. We'll travel to Bulgaria, Great Britain, Sweden, the Gaza Strip, and Switzerland, among other stops, to look at three political assassinations that remain worldwide mysteries. Specifically, we'll investigate the poisoning of the anticommunist journalist Georgi Markov, the shooting of controversial Swedish prime minister Olof Palme, and the poisoning of PLO leader Yasser Arafat.

Georgi Markov and the Poisoned Umbrella

- Georgi Markov was born near Sofia, Bulgaria, in 1929 and, after studying chemical engineering, became a teacher at a technical college; he also dabbled in writing. After 1954, when communist Todor Zhivkov became the leader of Bulgaria, Markov's avocation as a playwright and author began to expand into more subversive and dissident writings, particularly against communism.
- Increasingly, Markov's political and satirical writing garnered disapproval from the strict Bulgarian government. In the early 1970s, the author left Bulgaria and settled in London with a job as a commentator on BBC radio. Markov was ordered to return to his home country, but he refused and was granted political asylum by Great Britain. He continued his work at the BBC and Radio Free Europe, despite being convicted in absentia in Bulgaria.
- To stop Markov's anticommunist broadcasts, Zhivkov enlisted the help of his minister of the interior, General Dimitar Stoyanov. In June 1977, Stoyanov submitted a lengthy report to the Soviet Union's Politburo about the "enemy emigration" occurring out of Bulgaria and its damaging ramifications to state security. A secret agreement was made in which Stoyanov was given permission to contact Yuri Andropov, head of the KGB, to provide "technical support" in the killing of Markov.

- On September 7, 1978, while Markov waited for his bus to work, he suddenly felt a stinging pain in the back of his right thigh. He turned around and saw a heavyset man behind him bend over and pick up an umbrella. The stranger muttered “sorry” with a thick accent before getting into a taxi.
- That evening, Markov noticed redness and swelling on the back of his thigh. He developed a high fever and was admitted to the hospital the next day. Doctors were stumped by his symptoms, initially diagnosing him with blood poisoning. Markov died three days later of massive heart and organ failure, leaving behind a wife and a 2-year-old daughter. He was 49.
- Because Markov had reported earlier death threats he’d received to his coworkers, Scotland Yard ordered a full autopsy. Forensic pathologists noted fluid in his lungs and small hemorrhages dotting many of his organs. His liver showed signs of poisoning, but toxicology uncovered no obvious lethal substance in his body. An examination of Markov’s blood showed extremely high white cell counts, which are often seen in serious bacterial or viral infections, some cases of drug toxicity, and other causes of severe physical stress.
- During tissue sampling, a block of flesh was removed from the back of Markov’s right thigh, around the site of the initial injury. In it, forensic scientists discovered a metal pellet about 1.5 millimeters in diameter. The pellet had no clear traces of a poison, but doctors suspected that it had contained some type of natural toxin that dissipated in Markov’s body. Ricin, a slow-acting toxin whose symptoms mimic other illnesses or infections, was thought to be a likely candidate.
- After the fall of the Soviet Union in 1991, it was discovered that Soviet technicians had developed a modified umbrella that could be used as a type of syringe to inject something like the pellet used on Markov. It’s also possible that the umbrella may have served as

a distraction while the poison pellet was delivered into Markov's thigh by a syringe.

- The London police have tried to solve the Markov murder for decades. In January 1993, a likely suspect was discovered: Francesco Gullino, a Danish nationalist of Italian descent who was living and working as an antiques dealer in Copenhagen. Gullino admitted to working for the Bulgarian secret police but denied involvement in Markov's killing. The case remains open in England.

The Assassination of Olof Palme

- Olof Palme was born in Stockholm in 1927 to a wealthy, conservative family. He earned his law degree from the University of Stockholm and, afterwards, became an active member of the Social Democratic Workers' Party of Sweden. He steadily moved up in the ranks of the party and was ultimately elected leader. In 1969, he was appointed prime minister.
- Throughout his career, Palme was dedicated to "socialism, peace and solidarity" and was a frequent critic of both Russian and U.S. policies. He became a supporter of the Palestinian Liberation Organization (PLO), a group the United States considered a radical terrorist organization until the early 1990s. Needless to say, Palme had strong political opinions and made many enemies, as well as close allies.
- As prime minister, Palme enacted numerous governmental changes with the welfare of the people in mind, but in order to adopt these reforms, he significantly raised taxes. This move probably led to his loss in the 1976 election, ending 40 years of continual rule by the Social Democratic Party. But Palme remained involved with the party and was reelected prime minister in 1982.
- Given that he was a fairly controversial and outspoken leader of a large European country, Palme was not as concerned with security as he should have been.

- On February 28, 1986, he and his wife, Lisbet, went out to a movie; on the way home, a man wearing dark clothes and a ski mask shot the prime minister in the back at point-blank range. He fired a second shot at Mrs. Palme, but she sustained only a superficial wound.
- Some witnesses reported that a car carrying two other men picked up the assailant, but no one got the vehicle's license number. An ambulance rushed Palme to the hospital, where he was pronounced dead.
- The only pieces of forensic evidence recovered in the case were bullets removed from the victim's bodies. No bullet casings were recovered at the scene, which led police to believe that the gun used was a revolver.
 - As part of the investigation, police searched Palme's apartment and offices, trying to locate wire-tapping equipment that might have tipped off the assassins to the couple's evening plans. No surveillance equipment was found.
 - There have been claims that police work at the scene was sloppy and inadequate, and it has even been alleged that right-wing members of the Swedish police force could have been involved in the assassination.
- In 1988, a man named Christer Pettersson, a known drug addict and criminal, was named as a suspect. Lisbet Palme picked Pettersson out of a police lineup, and he was convicted primarily on her testimony. Less than a year later, Pettersson was released for lack of evidence. At one point, Pettersson confessed to shooting the prime minister but later recanted. He died in 2004 and remains the only person ever arrested for Palme's murder.
- More than 100 suspects have been brought up during the investigation of the Palme assassination, including supporters of apartheid in South Africa, Israeli Mossad assassins, right-wing

Chilean fascists, the Yugoslavian secret service, and even the CIA. The case has never been solved.

The Poisoning of Yasser Arafat

- Yasser Arafat was born in Cairo in 1929. His father was a Palestinian from the Gaza Strip, and his mother was from Jerusalem. She died when her son was only 4 years old, and he was sent to the Old City of Jerusalem to be raised by relatives.
- As a young man, Arafat studied Judaism and Zionism but ultimately became an Arab citizen and began to help smuggle arms into Palestine, which at that time was under British control. During the Arab-Israeli War of 1948, Arafat aligned himself with the Muslim Brotherhood. As a newly graduated civil engineer, he was called to fight in the 1956 Suez crisis, in which Egypt stood up to British, French, and Israeli control of the Suez Canal.
- Arafat was part of the guerrilla force in Gaza that was ejected when President Nasser of Egypt allowed the United Nations to take over the disputed area. Arafat went to Kuwait, where he and other Palestinians founded the Fatah movement. Fatah's ideology was to have Palestinians take back their land on their own, not through support from any established Arab government. The movement financed its efforts by making alliances with major businessmen, particularly those in the oil trade.
- In the early 1960s, Arafat moved to Syria and began to persuade fighters from the PLO's military arm to join him; from there, he crossed into the Jordanian-occupied West Bank to recruit more supporters. By 1969, Arafat had become chairman of the PLO, and for many decades, he served as the international symbol of the Palestinian struggle for independence.
- Arafat alternated between negotiation and violence in his politics. After the signing of the Israeli-Palestinian Declaration of Principles, he shared the 1994 Nobel Peace Prize with two Israeli officials. But he later participated in further violence against Israeli occupation

of the West Bank, Gaza Strip, and east Jerusalem. Ultimately, the Israelis put his compound under siege, and Arafat was held there in confinement beginning in 2002.

- In October 2004, at age 75, Arafat suddenly fell ill with what was thought to be stomach flu and was airlifted to a military hospital in France. He went into a coma and died about a month later. The official cause of death was a massive brain hemorrhage that resulted in a stroke. Despite questions surrounding his death, his wife would not allow an autopsy.
- Eight years after his death, in the summer of 2012, an Al Jazeera television station apparently convinced Mrs. Arafat to provide some of her husband's belongings for forensic analysis. The Swiss Institute of Radiation Physics found levels of the radioactive poison polonium-210 in Arafat's clothing. Polonium is one of the rarest elements in nature; if ingested, an amount the size of just one grain of sand can kill.
- After the discovery of the polonium, Palestinian officials reopened the investigation into Arafat's death. In November 2012, forensic experts took samples of Arafat's remains to be analyzed independently by teams from Switzerland, France, and Russia. A year after the exhumation, Swiss scientists reported that evidence supports the likelihood that Arafat was poisoned by polonium. Just as with the assassinations of Georgi Markov and Olof Palme, Arafat's cause and manner of death are finally known, but the identity of the perpetrators remains a mystery.

Suggested Reading

Blum, *The Poisoner's Handbook*.

Bondeson, *Blood on the Snow*.

Emsley, *Molecules of Murder*.

Sifakis, *Encyclopedia of Assassinations*.

Questions to Consider

1. Can you name other political assassinations than the three covered in this lecture?
2. Do you know of other cases where remains of potential or known assassination victims have been exhumed for further testing and analysis?

Mysteries of the Romanov Family

Lecture 18

Few political assassinations have involved targeting an entire family, but when power is handed down within bloodlines from generation to generation, one way to effect political change is to eliminate the family to which the power belongs. That was the case in 1918 for the House of Holstein-Gottorp-Romanov in Russia. In this lecture, we'll look at the execution of the Romanov family, the mysteries surrounding the location of the bodies, and new evidence discovered about the case in the 1990s. We'll also see the scientific process by which anthropologists identified the remains of the Romanovs after almost 75 years.

Execution of the Romanovs

- In 1917, Russia was not only fighting in World War I, but it was also heading into its own civil war. Czar Nicholas II had been in power since late 1894, but in 1917, he was on the front and seemed to be losing touch with the suffering of the Russian people back home. Nicholas had left his wife, Alexandra, in charge, but many Russians despised her because she was part German and part English; some even believed that she was a German spy.
 - Alexandra was also a carrier of hemophilia, a disease she had passed on to the couple's only son, Alexei.
 - Alexandra became close to the Russian mystic and healer Grigory Rasputin, believing that he could cure Alexei. Rasputin himself was murdered in 1916.
- Internal unrest of the Russian people ultimately resulted in the February Revolution in 1917, which led to the house arrest of the Romanov family and the forced abdication of Nicholas. The Bolshevik, or "Red," Party, headed by Vladimir Lenin, was rising in Russia. The anti-Bolshevik supporters of the czar were known as the "Whites."

- In October 1917, the Bolsheviks moved the czar and his family to a facility in Yekaterinburg, which had become the Red capital. Initially, the Bolsheviks planned to bring Nicholas to trial, but the White Army gained power and, in the summer of 1918, began to close in on Yekaterinburg; thus, the Reds changed their plan. There was too much to lose if the White Army somehow managed to free the Romanovs and reinstate Nicholas as ruler.



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According to later accounts, Czar Nicholas and Alexei were shot first, before a firing squad began killing the other family members and servants.

- On the night of July 16, 1918, Yakov Yurovsky, the chief Bolshevik guard at the house where the Romanovs were being held, ordered the royals and their servants to the basement.
 - In total, there were seven members of the Romanov family: Nicholas and Alexandra; their four daughters, Olga, Tatiana, Maria, and Anastasia; and the 13-year-old Alexei. The four servants included the family physician, maid, valet, and cook.
 - Historical references don't agree on all the details, but the consensus is that once in the basement room, Yurovsky told the assembled Romanovs and their servants that they had been gathered together to be executed. Yurovsky shot Nicholas first, then turned his gun on Alexei.
 - A waiting firing squad entered the room and began shooting the others. Although the executioners were told to aim for the heart, bullets ricocheted around the room madly. Because of

the danger to the executioners themselves, a decision was made to cease fire and bayonet the survivors. The dead were carried out of the building about 20 minutes after the first shots.

Mysteries in the Aftermath

- Although the execution of the czar was almost immediately publicized around the world, the gory details were held back. Early accounts made no mention of the murders of the rest of the family. Alexandra and Alexei were supposedly being held in “a place of security.” One of the reasons for the confusion was that Yurovsky ordered the disposal of the bodies in a secret location.
- Over the years, many versions of what happened to the bodies circulated. One 1935 account came from the American adventurer and author Richard Halliburton, who traveled to Russia to interview one of the alleged firing-squad members, Peter Ermakov. Ermakov told Halliburton that the bodies had been taken to an abandoned mineshaft near Yekaterinburg. There, the clothing and bodies had been burned.
- Despite the Bolsheviks’ best efforts, the White Army overtook Yekaterinburg about a week after the murders. When troops found the basement room, the crime scene had been scrubbed clean, but there were what looked to be bullet holes in the walls. The Whites also sifted through the ashes at the mine and found clothing and other items belonging to the victims. The only trace of human remains found there was a finger thought to belong to a middle-aged woman; perhaps it had been cut off to remove one of Alexandra’s rings.
- Among the spinoff mysteries related to the inability to locate the Romanov remains were rumors that some members of the imperial family had survived, especially the children. Over the decades following the murders, many imposters arose, including those claiming to be Alexei or Anastasia, the youngest of the four Romanov daughters.
 - Following a failed suicide attempt in Berlin in 1920, a woman known as Anna Anderson claimed that she was Anastasia. A

private investigator who did a background check on the woman identified her as a Polish factory worker named Franziska Schanzkowska, who had suffered from mental illness after a head injury.

- Anderson spent the rest of her life insisting that she was Anastasia. She traveled around the United States and Germany, gaining notoriety and media attention.
- In the late 1960s, a Charlottesville, Virginia, history professor who took an interest in Anderson's story married her to allow her to permanently relocate to the United States. The pair lived an eccentric life, and Anna died in Virginia in 1984; her body was cremated the day after her death.

Discovery and Identification

- In 1991, after the collapse of the Soviet Union, some previously unreleased government documents offered a different story of the events surrounding the disposal of the Romanov bodies. Apparently, the plan to burn the remains at the mine was changed at the last minute. But while the bodies were being driven to the new location, the truck got stuck in the mud, and the Bolshevik soldiers dug a pit and hastily burned the remains along the roadside.
- Following this lead about the disposal site, searchers discovered a 6-by-8-foot common grave that they immediately suspected contained the Romanov family. About 1,000 bones and bone fragments were recovered from the shallow pit. However, the burial contained only 9 skeletons—not the 11 that would have accounted for the Romanov family and their servants.
- Initial anthropology assessments suggested that the group consisted of five females and four males. Anthropologists use pelvic bones, skulls, and bone measurements to judge whether a skeleton is male or female, but that assessment can be made only for the remains of individuals who have undergone the typical skeletal changes associated with puberty.

- To determine which five of the six executed women were present and which four of the five men, anthropologists looked for signs of age, using both skeletal and dental development. Based on this analysis, all four males were adults and were assumed to be Nicholas (age 50), the family doctor (age 53), the valet (age 61), and the cook (age 48). None of the skeletons appeared to be from a child near age 13.
- To further identify the men, scientists turned to dental work—about which at least some facts were known—and photographic superimposition. In this process, known images of a person are compared to a skull to identify similarities between specific dimensions of the bones and the photo. Such comparisons focus on features that don't tend to change over the course of life, such as the distance between eye orbits, the width of the face, and so on.
- The five female skeletons were all from adults, but two were obviously older than the others, probably Alexandra (age 46) and the maid (age 40). One had platinum dental work, and Alexandra's diaries mentioned visits to the dentist. The other had substantial wear facets on the bones of her ankles, a sign of work done while on her hands and knees; she was assumed to be the maid.
- The four Romanov daughters were just five years apart in age, ranging from 22 to 17. Two of the young skeletons looked older than the third and, combined with photographic superimposition, were thought to be Olga (age 22) and Tatiana (age 21). The third skeleton showed features suggesting that it belonged to either Anastasia (age 17) or Maria (age 19), but scientists disagreed on that point. One of the sisters, along with Alexei, was definitely missing from the grave.
- The next step was DNA testing, the nuclear form of which was first used in forensics in 1986; it was still a relatively new technique for identification at the time the skeletons were discovered. Particularly new was mitochondrial DNA testing, which is especially useful on hair, bones, and other badly degraded samples.

- In 1992, samples were taken from fragments of teeth and bones of the nine skeletons from the suspected Romanov grave to be compared with known royal family reference samples. The results, released in 1993, showed that one set of remains belonged to Nicholas and another to Alexandra, and three were from the couple's daughters. The four other skeletons were not related to the Romanovs and were presumed to be the servants.
- The reference samples for Alexandra were taken from Prince Phillip, husband of Britain's Queen Elizabeth and the maternal grandson of Alexandra's sister. Because mitochondrial DNA is passed from a mother to all her children—whether female or male—and through the women down their entire bloodline, Prince Phillip's mitochondrial DNA exactly matched Alexandra's and those of her daughters.
- Confirming Nicholas's identity required the exhumation of his brother. Grand Duke George was the original heir to the Russian throne, but he died in 1899 at age 28. DNA samples from living relatives also confirmed that one skeleton belonged to Nicholas II.
- Richard Halliburton's 1935 publication provided graphic details of the assassination, relayed by Peter Ermakov, including the sequence of the killings and the weapons used. All nine skeletons showed facial fracturing, confirming that they had probably been hit with rifle butts. Some of the gunshot and bayonet wounds were also consistent with Ermakov's account.
- After the forensic analyses, the Romanov family was buried in St. Petersburg without the two missing children. But researchers continued to dissect Yurovsky's writings, and learned that two of the bodies had been buried separately from the others. In 2007, near the site discovered in 1991, metal detectors led investigators to a grave containing about 44 bone fragments and numerous bullets. In 2008, results of DNA testing showed that the two remaining Romanov siblings had at last been found.

Suggested Reading

Farquhar, *A Treasury of Deception*.

Maples and Browning, *Dead Men Do Tell Tales*.

Massie, *The Romanovs*.

Murray, *Forensic Identification*.

Primorac and Schanfield, eds., *Forensic DNA Applications*.

Rathbun and Buikstra, *Human Identification*.

Sifakis, *Encyclopedia of Assassinations*.

Slater, *The Many Deaths of Tsar Nicholas II*.

Steadman, *Hard Evidence*.

Questions to Consider

1. Do you know of other cases in which entire families have been killed for political reasons?
2. Had you heard of the Romanovs prior to this lecture? What did you know about the case, particularly with regard to the Anastasia imposters?
3. The Russian mystic and faith healer Grigory Rasputin was an advisor to the Romanov family. Can you think of other examples of a ruler or ruling family that had such a “spiritual” guide?

Forensics of Genocide

Lecture 19

The term *genocide* is used for the deliberate extermination of a targeted group of people—whether for political, racial, economic, or other social reasons. A key word in this definition is *deliberate*. To be considered genocide, a massive loss of life must have been intentional, unlike other types of mass fatalities, such as those stemming from natural disasters, disease, or other factors. There have been many tragic examples of genocide throughout world history; in this lecture, we'll learn about some of the technology being used to locate and study mass graves, and we'll look at a case study of genocide and the exhumation of mass graves in Guatemala.

Genocide in the 20th Century

- The 20th century witnessed a number of genocides. Among these was the Turkish decimation of as many as 2 million Armenians during and after World War I, in what some say were the first organized concentration camps. Shortly after that, in the Soviet Union, about 20 million died at the hands of Joseph Stalin—from both his failed socialist agricultural projects and as targets of his regime.
- The agricultural, industrial, and social changes of Mao Zedong's Great Leap Forward also led to mass deaths from starvation throughout China in the late 1950s and early 1960s. In the Cultural Revolution that followed, anyone believed to be anti-government was imprisoned or murdered. Estimates of the number of people killed in China between 1949 and 1976 range from 50 to 70 million. We find intent in both Stalin's and Mao's agricultural genocides because the practices continued despite the knowledge that so many were dying as a result.
- Probably the most well-known genocide came at the hands of the German Nazis, who killed about two-thirds of Europe's Jews in the 12-year Holocaust between 1933 and 1945. Total estimates are that



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In addition to Europe's Jews, others targeted in the Holocaust included Jehovah's Witnesses, Roma and Polish people, Russian prisoners of war, homosexuals, and people with physical or mental disabilities.

11 million people died—most by poison gas administered in Third Reich death camps.

- No one really knows the number of people who have died in North Korean prison camps since 1945 or from the longstanding practice of refusing or diverting aid from starving Korean peasants. And in just the three years from 1975 to 1978, Pol Pot's Khmer Rouge exterminated about 2.2 million in the Killing Fields of Cambodia.
- The Kurdish genocide in northern Iraq that occurred in the late 1980s under Saddam Hussein killed almost 200,000 people, including other minority groups in the region. And the Hutu killing spree in Rwanda in 1994 left somewhere between 500,000 and 1 million of the Tutsi people dead, while the United Nations pulled out its troops and abandoned the country.

Mass Graves

- According to the United Nations, a mass grave contains three or more executed people but could include many more. In addition, genocides may involve a tremendous number of separate burial locations. For example, in Cambodia, mapping teams have already identified more than 20,000 gravesites from the Khmer Rouge's three-year killing spree.
- Locating clandestine graves can be difficult. Memories of witnesses fade and topography changes over time. Forensic scientists have developed new technologies or adapted existing ones to help find the graves of genocide victims before they are forever lost.
 - For example, scientists working with the forensic arm of Physicians for Human Rights and the International Commission on Missing Persons have used ground-penetrating radar to find subsurface disturbances. This technology can even potentially show where bodies were after they've been removed, as was common after the Bosnian War.
 - Since about 2005, forensic investigators have also used before-and-after satellite images to try to find evidence for mass graves from the air.
- In early 2013, forensic anthropologists at the University of Tennessee's Anthropological Research Facility—known as the Body Farm—began a project with the goal of learning more about identifying mass burials. Researchers there have buried 10 donated human bodies and plan to monitor the burials over the course of three years to study changes on the surface and underground at the sites.
 - Light detection and ranging (LIDAR) technology will be used to map the surface topography. Multispectral imagery will be used to identify soil and vegetation changes that occur after a grave is constructed.
 - In addition, entomologists have been brought in to look at insect succession; botanists will study plant changes; soil experts will analyze chemical isotopes; and molecular genetics

researchers will examine whether bodies in multiple graves can contaminate one another's DNA profiles.

- The goal of the project is to identify some combination of techniques that will ultimately provide a faster, safer, and more definitive approach to locating mass graves from genocides, perhaps using drones.

Case Study: Genocide in Guatemala

- Between 1960 and 1996, more than 200,000 people were murdered in Guatemala. The majority were of Mayan descent. They were victims caught in a political crossfire between ruthless government military forces and Marxist guerrilla rebels who sought to overthrow the corrupt administration. This genocide was mostly about race and land use, and the bulk of the killings occurred in the highlands where the majority of Mayans live.
- Some non-Mayan citizens, particularly Latinos of high socioeconomic status who held anti-government views, also quietly disappeared during this time. Many of these people were from the city centers and universities, mainly college faculty, students, and others who sought political reform. The fate of nearly all these victims is still unknown.
- In the summer of 2004, forensic anthropologists, social anthropologists, and archaeologists were working in and around Guatemala City and in the mountains near the town of Chichicastenango. Those working to investigate the genocide had received many death threats, and the entrance to the laboratory of the Guatemalan Forensic Anthropology Foundation was heavily guarded.
- The hallways of the foundation's offices and lab were lined with wooden coffins of the size that would be used for infant burials. These are used to house the decomposed remains of victims exhumed from mass graves by the archaeologists because fragmentary skeletons don't require adult-sized caskets. After

graves were exhumed, the remains were brought to the lab, where anthropologists attempted to identify the dead and document injuries observed on the bones in the hopes of using the information to prosecute war crimes.

- In the foundation's lab, scientists document wounds to the skeletons that can often be corroborated by eyewitness accounts of the murders gathered by social anthropologists. Gunshot wounds attest to the typical method of execution, but some remains show evidence of machete wounds or smashing of the skull.
- Most of the Mayan victims in the highland graves are known individuals. They were executed, either alone or in small groups, and their bodies were left to rot as examples to their family members and fellow villagers. Often, the murderers did not permit the families to bury their dead.
 - After the killers moved on, family members frequently snuck back to the scene to quickly and secretly bury their loved ones, usually in unmarked graves. Thus, in many cases, the villagers could actually lead anthropologists to the graves.
 - The reason for disturbing the dead was to make legal records of their deaths and to allow family members to properly rebury their loved ones.
- To find the graves, trained social anthropologists visit villages to interview witnesses to these old crimes.
 - In a village near Chichicastenango, a middle-aged man named Don Diego described the murder of four of his friends and his brother. The men were assumed to be conspiring against the government simply because they were gathered together outside a small store one afternoon.
 - Diego and the other men were chased into the woods by some soldiers; Diego ran in a different direction than the others. As he hid, he heard gunshots. The next day, he and some of the villagers went into the woods and found the bodies of the five

men riddled with bullets. Diego and the others buried their friends deep in the woods near the top of a mountain.

- Twenty-two years later, the graves were uncovered by forensic anthropologists as the families and friends of the dead men gathered around the exhumation site.
- In another village near Chichicastenango, two graves were hidden in the cornfields, near the edge of the forest. In one of the graves, three bodies had been covered with beautiful Mayan blankets. Under the cloth was discovered the remains of what appeared to be an adult female and two small children, one about 5 years old and the other, an infant. When they were buried, the youngest had been wrapped in the female's arms. The importance of establishing the ages and identities of these victims is to show that they were not enemy combatants.
- In a typical scenario, guerrillas would come through a village and ask for food, shelter, and clothing. If the Mayans refused, the guerrillas would kill them, but if the village cooperated and the government forces found out, the military would execute the whole village or just some as an example to others. Loved ones were often made to watch—and sometimes even forced to participate in—the torture and killing of their family members.
- Eventually, as a result of the bravery of those who came forth and told their stories, graves have been exhumed, injuries have been documented, and identifications have been made. Following that, the bones of the dead can be bundled into small coffins; the government can issue death certificates; and preparations can be made to return the remains to their families.
- In early 2012, Efraín Ríos Montt—a former general in the Guatemalan army who became the country's de facto president during the worst of the atrocities—was finally tried for genocide and crimes against humanity. He was found guilty on May 10, 2013, and sentenced

to 80 years, but just 10 days later, the decision was annulled on a technicality. A retrial has been set for January of 2015.

Suggested Reading

Kiernan, *Blood and Soil*.

Mallet, Blythe, and Berry, eds., *Advances in Forensic Human Identification*.

Montejo and Perera, *Testimony*.

Murray, *Forensic Identification*.

Rathbun and Buikstra, *Human Identification*.

Steadman, *Hard Evidence*.

Totten and Parsons, eds., *Centuries of Genocide*.

Questions to Consider

1. What types of forensic methods are used to identify and/or analyze the remains of victims of genocide?
2. What are some of the worldwide efforts and/or organizations that work to help prevent these types of atrocities?

The Nazis and the Witch of Buchenwald

Lecture 20

One of the reasons that the Nazis stand out in the West as well-known perpetrators of atrocities is that before Hitler's rise to power, Germany didn't have a history of brutality against its own people. Paradoxically, at the time Nazism arose, Germany was among the most highly cultured and educated societies of its time, but the Third Reich stood in stark contrast to that. In part, it is because of the sophistication of German society—particularly in medicine, science, and technology—that we have a record of evidence regarding what happened under Nazi rule. In this lecture, we will discuss some of the forensic evidence involving the Nazis and how it was used at trial.

Background on Buchenwald

- Buchenwald was opened in 1937 and, with its satellite labor sites, was the largest of the concentration camps on German soil. Over the period of its operations, the site was used to house 240,000 people that the Germans considered undesirable because of mental or physical disabilities, sexual orientation, or religious differences. The camp also housed political detainees, including as many as 350 Allied prisoners of war.
- Although Buchenwald was not specifically a Nazi death camp, accounts indicate that 33,462 prisoners died there. An additional 8,483 Russian POWs were executed upon arrival at Buchenwald, and about 13,500 people died during the death march to evacuate prisoners as the Allies closed in the camp. In total, about 56,500 people died at or while leaving Buchenwald.
- The majority of the deaths at Buchenwald were not random or unanticipated events. Some prisoners were murdered—either by shooting in the stables or hanging in the camp crematorium—but most died from starvation or were simply worked to death;

some of those deemed too weak to work were transferred to extermination camps.

- Buchenwald was a training site for the Schutzstaffel (SS), whose members learned the incarceration, torture, and prisoner work-detail methods of the Third Reich at the camp. Buchenwald was also the site of Nazi medical trials and other experiments on prisoners, after which most died or were killed. Life expectancy at Buchenwald was estimated at just three months.

Human Experimentation

- The Nazis kept meticulous records of their human experimentation and preserved human specimens. In some studies, they removed portions of prisoners' nerves, muscles, and bones to examine tissue regeneration. Healthy people were infected with hepatitis and malaria or dosed with mustard gas. People were subjected to extreme cold or low oxygen levels to simulate high altitudes. All manner of wounds were created, then fragments of glass, wood shavings, and bacteria were rubbed into them to test antibiotics and other treatments.
- The primary intent of these experiments was to look for ways that the German military could counter frostbite, altitude sickness, and common wartime injuries and infections. But there were other studies, too, such as the use of X-rays, surgery, and drugs to sterilize people.
- At Buchenwald, the laboratories carried out experimentation in three particular areas: poisoning, chemical burns, and vaccines for typhus. These were of interest to the Third Reich military because of their usefulness in either murder or warfare-related injuries.
 - In the poison studies, Buchenwald prisoners were given various toxic substances in their food, after which they would either die and be autopsied or be killed for autopsy. In addition, some inmates were shot with poison bullets to study the effectiveness of administering toxins at long range.

- Non-anesthetized Buchenwald prisoners were also burned with phosphorous-containing compounds—the type used in incendiary bombs to set fire to buildings and other targets during warfare. The purpose was to research different types of medical treatments, such as salves and ointments developed by the Buchenwald scientists.
- The third major area of experimentation at Buchenwald involved typhus. Healthy prisoners were infected with typhus to create a living reservoir of bacteria for study. More than 90 percent of those inmates died. Researchers used another population of prisoners for typhus experiments, administering several types of potential vaccinations before infecting the subjects with typhus several weeks later. Another group served as a scientific control, receiving no vaccine, only the infection.
- In 1946, at the Nuremberg trials, a specific set of hearings was held about Nazi medical experimentation, known as the Doctors Trial.
 - Witness testimony, scientific journals, medical records, pathology specimens, and photographs were all used as forensic evidence to document the cruel experiments conducted on the prisoners at Buchenwald and elsewhere. Some of those involved were acquitted; others were sentenced to prison terms; and some were put to death.
 - Specific decisions made at Nuremberg helped refine and codify ethics for the use of human subjects in research.

The Witch of Buchenwald

- One of the commandants at Buchenwald was Karl Otto Koch; together with his wife, Ilse, Koch was arrested in 1943 by his own Nazi superiors for criminal behavior. It was alleged that the pair used prisoners for private gain, murdered those prisoners to keep them from talking, and embezzled from the Third Reich.
- Koch's superiors discovered that he had several of the medical personnel at Buchenwald shot, then listed them on death records

as political prisoners. It was later discovered that the executed men had treated Koch for syphilis, and he didn't want his illness known.

- Koch was tried in an SS court, found guilty, and executed by a Nazi firing squad in 1945. The prior year, his wife had been acquitted on all charges of corruption owing to lack of evidence, after which the 38-year-old Ilse went to live with family away from Buchenwald.
- Karl Koch had become commandant of Buchenwald in 1937, but a couple of years before his arrest in 1943, he was transferred to occupied Poland to help establish a Nazi camp there. In his absence, Ilse—known as the Witch of Buchenwald—gained prominence and may even have filled a supervisory role at the camp. She is alleged to have become quite predatory on prisoners and promiscuous with other camp leaders.
- Ilse enjoyed watching all manner of punishment doled out to inmates. She's alleged to have engaged in random acts of violence, including riding around on horseback and lashing out at prisoners at whim. Ilse teased the prisoners and guards with her sexuality. She is said to have watched male prisoners strip naked upon their arrival at camp and made lewd comments about the prisoners' bodies to other SS wives.
- Ilse was particularly friendly with one of the Buchenwald physicians, who was preparing a dissertation on tattoos as indicators of criminal behavior. It is alleged that Ilse came up with the idea of having the tattoo study done at the camp.
 - About 40 inmates with particularly interesting tattoos wound up at the infirmary and never returned. After that, pieces of tattooed skin were found in the Buchenwald pathology lab. It was alleged that the skin was used to make lampshades, book covers, knife sheaths, and handbags and that fellow prisoners were forced to manufacture the artifacts.
 - It was also said that the Nazi pathologist at Buchenwald tried his hand at making shrunken heads from prisoners. Some of

these objects were given to SS members as gifts, while Ilse kept others.

Liberation

- On April 4, 1945, the first Nazi camp to be liberated by U.S. forces was one of the Buchenwald work camps. In response, the Nazis at the main Buchenwald facility began the prisoner evacuation march. A week later, some of the remaining prisoners—who knew by clandestine radio communications that Allied liberators were on their way—rushed the watchtowers and killed the guards, using guns they had been stealing and stashing for years.
- Later that afternoon, the U.S. army arrived, and soon, the 21,000 camp survivors received food, water, and medical attention. The liberators were shocked by the appearance of the inmates. The next day, journalist Edward R. Murrow visited Buchenwald to report its horror to the world. He saw stacks of bodies by the crematorium and tried to count at least some of the dead but gave up after he reached more than 500.
- General Patton ordered military personnel to force local German citizens to witness the Nazi atrocities that had been going on nearby. They made both men and women exhume victims from mass graves where the signs of torture and violent death were clearly observable. Civilians were forced to march to Buchenwald and parade past piles of dead bodies and a table that held alleged human artifacts.

Ilse's Trials

- Among many stories the Allies heard from the survivors at Buchenwald were accounts of Ilse Koch's legendary brutality and sadism. After the war ended, she was among the first of the Nazis to be tried in a U.S. military court martial. The proceedings began on April 1, 1947, at Dachau. Ten days later, despite her claims that none of the accusations was true, the Witch of Buchenwald was found guilty of "violation of the laws and customs of war" and sentenced to life in prison.

- The trials at Dachau were later reviewed, and Ilse's sentence was commuted to four years—essentially, the time served since her arrest.
 - During the review process, Ilse's American defense attorney criticized the prosecution based on the lack of any forensic evidence solidly connected to her, especially related to the accusations that ornamental goods had been made of human skin at her request.
 - No lampshade had been produced at trial, despite its presence in many photographs taken during the liberation. American authorities admitted that it had somehow gone missing.
- After Koch's sentence was commuted, an irate public pushed for a retrial in the German courts. She was rearrested in 1949 and charged by the prosecutor's office in Bavaria. The second trial began in 1951 and lasted seven weeks.
 - This time, four witnesses testified that Koch was observed to be personally involved in choosing prisoners with tattoos or engaging in other actions related to the manufacture of lampshades from human skin. Again, however, no lampshades or other ornamental objects made from skin could be produced. Charges related to those allegations were dropped.
 - But in January 1951, the Witch of Buchenwald was found guilty of incitement to murder, incitement of attempted murder, and incitement of bodily harm. She was again sentenced to life in prison.
- We will never really know what crimes Ilse Koch was guilty of, but from the time she was picked up by the American military in the summer of 1945—after being recognized by a former prisoner at Buchenwald—she spent the rest of her life incarcerated, either by sentencing or in awaiting trial. Whether we believe she was as hideous as accounts say or was a scapegoat or surrogate for Nazi atrocities, she never walked free again. In 1967, she hanged herself in a German prison.

Suggested Reading

Kiernan, *Blood and Soil*.

Przyrembel, "Transfixed by an Image."

Totten and Parsons, eds., *Centuries of Genocide*.

Whitlock, *The Beasts of Buchenwald*.

Questions to Consider

1. What are some of the technological advances of the mid-20th century that were misused by the Nazis to commit mass killings?
2. What technological advances of the time allowed the collection of evidence against the Nazis?
3. Do you think Ilse Koch was a scapegoat for the Nazis? If so, what is the basis for your conclusion?

The Spies Have It

Lecture 21

Espionage is as old as human history itself. Clandestine observation and reporting have affected political affairs around the globe and caused battles to be won and lost. When you think about it, we probably don't even know about history's best spies or most interesting cases of espionage because they were never exposed. In this lecture, we'll look at a few famous examples of undercover activities of the last 100 years.

The Duquesne Spy Ring

- William Sebold had served in the Imperial German Army during World War I but moved to the United States after the war's end. By 1936, he was a naturalized U.S. citizen and worked as an engineer in various industrial plants. In 1939, during a trip to Germany, Sebold was approached by a high-ranking member of the Gestapo to persuade him to spy on America.
- Fearing danger to family members still living in Germany, Sebold reluctantly agreed. Under German guidance, he received training in radio communications and microphotography. But while he was still in Germany, Sebold's passport was stolen, forcing him to make a trip to the American consulate in Cologne, where he revealed his recent encounter with the Gestapo.
- Sebold told U.S. officials of the Nazis' plans for him but said that he wanted to work with the FBI as a double agent against Germany. He had been told by the Germans that he was to play the role of Harry Sawyer, a diesel engineering consultant. He would receive and respond to encoded messages from the Nazis.
- In February of 1940, Sebold returned to New York, and within a 16-month period, an FBI agent posing as German spy Harry Sawyer sent and received more than 500 phony messages. The FBI outfitted Sebold himself with an office in Manhattan where he could meet

with other German spies; the office was bugged and had two-way mirrors through which Sebold's encounters with German agents could be filmed.

- Among Sebold's German contacts was Frederick Duquesne, who was born in South Africa but became a U.S. citizen in 1913. Duquesne particularly hated the British because several of his family members had been killed in the Boer Wars; as a result, he had spied for Germany during both world wars.
 - Duquesne's World War II spy ring consisted of 33 men and women. Nearly all the men were originally from Germany, and most had become naturalized U.S. citizens.
 - The purpose of Duquesne's spy network was to collect information about military and industrial weaknesses of the United States that could be exploited should America enter the war, which happened, of course, after the Japanese bombed Pearl Harbor.
- The Germans set up a meeting between Sebold—as Harry Sawyer—and Duquesne, during which Duquesne told Sebold about ways German agents could set fire to American industrial plants. Duquesne also shared plans he'd stolen from the DuPont Corporation that illustrated the new atomic bomb being developed by the United States. Sebold relayed the information to U.S. authorities.
- Based on the Sebold sting operation, in late June and early July of 1941, all 33 members of the Duquesne spy ring were captured. In January 1942, all 33 were sentenced to serve a total of more than 300 years in prison. Sebold disappeared after the trial, presumably into a witness protection program. He is thought to have died in California in 1970.

Velvalee Dickinson

- Another infamous spy of World War II was Velvalee Blucher, born in 1893 in Sacramento, California. After attending Stanford

University, Velvalee worked at an agricultural brokerage firm in San Francisco for Lee Dickinson, the man she would later marry. Her husband's company had many Japanese and Japanese-American clients, and as a result, Mrs. Dickinson became fascinated with Japanese culture. In 1937, the couple moved to New York City.

- In New York, the couple opened a shop selling rare and antique dolls. It was run by Velvalee and catered to wealthy collectors in the United States and around the world. At first, the shop barely stayed afloat, but the couple's fortunes mysteriously turned around after the United States entered World War II.
- Less than two months after the Japanese attacked Pearl Harbor, wartime censors began intercepting letters that had been sent to a Buenos Aires address but were returned marked "address unknown." The letters were from different senders in the United States.
 - Each letter mentioned dolls and contained bits of personal information about the supposed sender, who denied writing the letters.
 - More curiously, according to the alleged senders, the personal information about them in the letters was correct, and the signatures even resembled their handwriting, but they hadn't sent the letters.
 - Cryptographers easily determined that the references to dolls and other information in the letters correlated with the status and location of U.S. ships, especially those that had been damaged at Pearl Harbor.
- When trying to connect information from the letters and the unsuspecting U.S. citizens whose names and addresses had been hijacked, the FBI came up with a single commonality: All the victims of the scam had done business with Velvalee Dickinson's New York doll shop.

- The letters were all postmarked between January and June of 1942 from a variety of U.S. cities. The FBI found hotel records establishing that the Dickinsons had been in those cities around the dates the letters were mailed. Digging into Mrs. Dickinson's background, the FBI found that her contacts with a variety of Japanese organizations spanned major cities in the United States and dated back to the early 1930s. Apparently, none of these contacts had notified Velvalee that the woman in Buenos Aires to whom she'd been sending coded messages had moved.
- The FBI watched the Dickinsons for some time, hoping to gain more information about a possible spy ring. After Mr. Dickinson died of heart disease in March 1943, agents decided to close in on Velvalee. She was arrested on January 21, 1944; in August of 1944, she was convicted of evading censorship laws and sentenced to 10 years in federal prison. She got an early release in 1951 and disappeared from public view in the mid-1950s. No one apparently knows how, where, or when she died.

Mata Hari

- The woman known as Mata Hari was born in the Netherlands in August of 1876 as Margaretha Zelle, the only daughter of a wealthy businessman who eventually went bankrupt. At age 18, she married Rudolph MacLeod, a Dutch army captain stationed in Indonesia (known at the time as the Dutch East Indies). MacLeod was 20 years older than Margaretha and allegedly abusive to her. Their unhappy marriage led to two children, but the couple's son died at age two.
- While living on the island of Java, Margaretha is said to have become enamored with two things that would end up directing the rest of her life: Indonesian dance and men in uniform. In 1902, she and her husband returned to the Netherlands, separated, and began a custody battle for their young daughter. When her husband threatened to stop supporting the child, Margaretha gave over custody and moved to Paris to start a new life.

- In Paris, Margaretha capitalized on her exotic beauty; she marketed herself as Mata Hari, a Hindu princess from the Far East, and quickly became a successful exotic dancer. She began to have relationships with rich and powerful men, including military officers and politicians. In 1914, she agreed to a six-month contract in Berlin, but when World War I broke out in August of that year, the job fell through, and Mata Hari returned to the Netherlands.
- She was recruited as a wartime spy by the Germans but apparently did little to earn the money they paid her, except to resume her European travels. Around the same time, she also agreed to act as a double agent for French counterintelligence.
- As a result of her frequent European travels, her liaisons with men of all nationalities, and the fact that she could speak multiple languages, Mata Hari was constantly watched by numerous military intelligence agencies. In 1916, Scotland Yard detained her for questioning but couldn't pin anything on her.
- In January of 1917, the French intercepted a radio message from the German military that credited Mata Hari with transferring information to them. In February 1917, Mata Hari was arrested in Paris and put on trial, but neither the French nor the British could bring forth any definitive forensic evidence or testimony against her. Her defense attorney—a former lover—was not even allowed to cross-examine the prosecution's witnesses.
 - Despite her claims that her international liaisons were due to nothing more than her infamous exotic dancing, Mata Hari was found guilty after only 45 minutes of deliberation and executed by a French firing squad in October 1917.
 - Today, for all the infamy that's been associated with her name, sources disagree on whether Mata Hari actually ever spied for anybody.

Robert Hanssen

- Throughout the late 1980s, the FBI began to recognize that there was a dangerous double agent in its midst. The KGB was increasingly in possession of highly classified information that could only be coming from one or more of the FBI's own agents.
- When the USSR disbanded in 1991, the KGB's successor agency became known as the SVR. For a while after the transition, it looked as though the leaks had stopped, but soon, the double agent appeared to be working again. By the late 1990s, the FBI and the CIA were focused on one particular man, but after two years of investigation and surveillance, they realized their target was not the mole.
- The FBI next identified a former KGB operative who claimed he could find information on the double agent. The Russian agreed to surrender files he had stolen on the American mole in exchange for the FBI's promise of \$7 million, along with safe passage to the United States and new identities for his entire family; to this day, that Russian's name remains classified.
- In November of 2000, the FBI identified the mole as Robert Hanssen, an expert in wiretapping, surveillance, and computers who had worked for the FBI for nearly 25 years. In December



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Before Hanssen made his final drop, FBI agents searched his car and found seven classified documents that he had downloaded to his palm device and apparently planned to pass to the Russians.

2000, the FBI promoted Hanssen to a new position and gave him an assistant, who was assigned to watch Hanssen's every move. Agents also began 24-hour surveillance of Hanssen's home.

- Hanssen was finally caught making a drop on February 18, 2001. Since 1985, he had apparently passed thousands of pages of documents to the KGB and, later, the SVR. His motive was purely financial; over the two decades he was a double agent, he received nearly \$1.5 million in cash and diamonds from the Russians. On July 6, 2001, Hanssen pled guilty to espionage and was ultimately sentenced to life in prison with no possibility of parole.

Suggested Reading

Butler and Keeney, *Secret Messages*.

Hynd, *Passport to Treason*.

Robenault, *The Harding Affair*.

Shipman, *Femme Fatale*.

Sylado, *My Name Is Mata Hari*.

Wise, *Spy*.

Questions to Consider

1. How has spying changed over the past 50 years, 100 years, 200 years, or more?
2. What are some of the lines of evidence investigators use to identify spies?
3. How common do you think spying is today, and where do you believe it is occurring? Do you think there's more spying today or less than there was in the 1900s?

Motive and Kidnapping

Lecture 22

At the mention of kidnapping, most people think of cases in which someone is held for ransom, but there are many different motives for kidnapping. People have been abducted into slavery, and warring factions have taken prisoners. Human trafficking networks for forced labor or the sex trade are still serious criminal enterprises, and in developed countries, kidnappings of children by noncustodial parents are far more common than any other type of abduction. Motive is often an important consideration in abduction cases because the motive can lead investigators to likely suspects or to locations where victims are being held. In this lecture, we'll look at some historical and modern kidnapping cases.

The Munich Massacre

- Three years after World War II ended, Israel was founded as a Jewish homeland in what was then the territory of Palestine, creating lasting conflict between the Israeli and Palestinian people. Israeli-Palestinian hostility has spawned numerous terrorist organizations, including one known as Black September, formed in 1970. One of its most notorious acts was a mass kidnapping carried out in 1972 during the summer Olympics in Munich, Germany.
- On September 5, 1972, at approximately 4:30 a.m., eight armed members of Black September entered the Olympic Village compound. Within a short time, the terrorists had taken nine Israelis captive and killed two others. They held the hostages in an apartment building of the Olympic Village and dropped a list of demands out the window: They wanted the release of 234 prisoners in Israel's custody and two German founders of a militant neo-Nazi group, the Red Army Faction—all by 9:00 that same morning.
- Among the most striking aspects of this kidnapping was the real-time media coverage it carried, beginning within about a half-hour of the initial attack. This coverage created an additional problem

in an already-tense situation: The Palestinian terrorists were also watching everything unfold on TV in the apartment where they were holding the hostages.

- Israel was unwilling to negotiate with the terrorists, fearing further attacks. The Germans offered unlimited money and even a trade of prominent Germans for the captives, but the Palestinians refused.
- One of the keys in hostage situations is to buy time to enable authorities to plan and learn more about the background of the terrorists. Negotiators were about to get four extensions throughout the day, but with all the cameras focused on German police moving into position, by 5:00 p.m., the Palestinians refused any further delays.
- At 6:00, the terrorists demanded to be flown to Cairo, Egypt. German authorities agreed to transport the Palestinians and their hostages to a military airbase outside Munich on two helicopters, followed by a third helicopter of German officials. Authorities told the terrorists they could board a Cairo-bound plane at the airstrip, but in reality, the Germans were planning an ambush. They had snipers positioned when the helicopters landed at the base at approximately 10:30 p.m.
- When two terrorists examined the waiting plane on the airstrip and found no flight crew, they realized that their demands weren't being met. As they ran back to the helicopter, one of the snipers shot and wounded one of the Palestinians. Sharpshooters opened fire and killed two other kidnappers, but the hostages were still bound and unable to get away. The remaining terrorists sought cover and returned fire, and a standoff began.
- By around midnight, the Germans were able to get armed personnel carriers onto the airbase; at that point, the terrorists probably realized they were trapped. At 12:04, a kidnapper opened fire on four hostages in one of the helicopters, then threw in a hand grenade, incinerating the chopper and all those in it.

- Then, the terrorists turned to the second helicopter, where the remaining five hostages were strafed with gunfire. By 1:30 a.m., the battle ended. All of the Israeli captives were dead, along with five members of Black September; three terrorists were captured.

Aftermath of the Massacre

- Three days after the Munich attack, 10 bases of the Palestine Liberation Organization (PLO) were bombed by Israeli airstrikes in Syria and Lebanon, killing an estimated 200 people.
 - A little more than six weeks later, PLO terrorists hijacked a Lufthansa flight and demanded the release of the three surviving Munich kidnappers. German authorities immediately complied, and those terrorists have never been brought to justice.
 - The following April, members of Israel's Mossad intelligence and the Israeli army stormed an apartment building in Beirut, killing three senior PLO members in retaliation for the Olympic executions the year before.
- In 2012, as the 40th anniversary of the Munich Massacre approached, the German magazine *Der Spiegel* published a series of articles, summarizing the results of a comprehensive analysis of formerly classified government documents related to the incident. The analysis alleges that German authorities ignored clear warnings of the Munich attack and points to documentation that German officials intentionally covered up many mistakes they made during the hostage negotiations and the ambush.
- The German government has never publicly acknowledged connections between any German citizen and the Black September group. However, *Der Spiegel* cites a 1973 police report on the Munich Massacre as definitively linking German neo-Nazi criminals to the Munich kidnappers.
- Perhaps most shocking was *Der Spiegel's* allegation that after the kidnapping, German officials maintained both secret and

blatant diplomatic contacts with the masterminds behind the Munich Massacre.

- In late 1972, a senior German Foreign Ministry official actually sought out the PLO to broker an agreement in which the Palestinians would refrain from attacks on West Germany.
- Yasser Arafat, then-leader of the PLO, agreed in early 1973 to abide by Germany's request, if the Germans would allow him to install a Palestinian envoy in Bonn. Amazingly, the man Arafat sent—who remained in Germany until 2005—Abdallah Frangi, had been knowingly and directly involved in the Munich Massacre.
- Although German authorities have open warrants for the arrest of the remaining three Munich kidnappers—one of whom has appeared in film documentaries, but two of whom are suspected dead—*Der Spiegel* found no evidence that German officials have ever actually pursued them.

J. Paul Getty Jr.

- In 1957, J. Paul Getty, founder of the Getty Oil Company, was named the wealthiest man in the world, with a net worth estimated between \$700 million and \$1 billion. One of his five sons was Eugene Paul Getty, who later changed his name to J. Paul Getty Jr.
- After he married and had a son—named J. Paul Getty III—Getty Jr. was sent to Italy to run the Italian branch of Getty Oil. But Getty claimed he wasn't cut out for the oil business, and he and his wife ultimately divorced. He then married a second time, moved to England, and was disinherited by his father.
- After his parents divorced, Getty's son, who was called Paul, stayed in Italy with his mother, but he was a troublemaker and was expelled from school by age 15. On July 10, 1973, at age 16, Paul was kidnapped in Rome.

- His captors called Paul's mother, demanding \$17 million, but neither she nor Paul's father could afford the ransom. The estranged couple turned to Paul's grandfather, the original J. Paul Getty, but he refused to pay.
- After months with no resolution, the kidnappers—members of the Calabrian mafia—reduced the ransom to \$3 million, but still it was not paid. In November, four months after the kidnapping, a newspaper in Rome received a package containing a decomposing right ear. A note indicated that the ear belonged to Paul, and if the kidnappers didn't receive the money within 10 days—a deadline that had already past—Paul would begin to arrive “in little pieces.”
- Authorities wondered if the ear was really Paul's or could have been removed from a corpse. Although 1973 was before the advent of DNA technology for identification, blood typing could have been used to show consistency between Paul's blood proteins and the discovered ear. It's also possible that if an ear print was on record for Paul, it could have been compared to the ear in the package. Rarely, ear prints can be used in forensic science in much the same way as fingerprints.
- After another newspaper received photos of Paul's wounds, his grandfather finally agreed to pay \$2.2 million and to loan the balance of the ransom demanded by Paul's captors to Getty Jr. On December 15, more than five months after the kidnapping, Paul was released. The ensuing investigation led to the arrest of nine men, but only two were ever convicted and imprisoned, and most of the ransom money was never found.

Paula Beverly Davis

- When Paula Beverly Davis didn't come home on the night of August 9, 1987, her roommate called Paula's mother at 3:00 a.m. The roommate said that she had last seen Paula earlier that evening at a truck stop along Interstate 70, just outside of Kansas City.



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Some hospitals use sensors in wristbands to monitor the movements of infants throughout the facility and prevent kidnappings.

- Mrs. Beverly contacted police and described her daughter, including the fact that she had two tattoos on her chest: a unicorn and a rose. Authorities reminded Mrs. Beverly that Paula was an adult and may have simply disappeared of her own volition, but her family didn't believe Paula would do that.
- The day after Paula disappeared, the recently deceased and nearly nude body of a young, white female, was found along Interstate 70—but it was 600 miles east of Kansas City, in Montgomery County, Ohio. An autopsy was performed, and the cause of death was ruled to be strangulation by ligature. When no identification was made, the woman's body was buried in a cemetery in Dayton.
- For more than two decades, although leads were explored, the identity of the young woman was not known. In the spring of 2009, however, officials from the Montgomery County Coroner's Office entered all of the deceased's pertinent information into the new National Missing and Unidentified Persons System (NamUs).
 - That fall, Paula's sister, Stephanie Beverly Clack, heard about NamUs and visited its website. After just a half-hour on the

system, Stephanie found a match for her sister: a woman found on August 10, 1987, who had two tattoos on her chest, a unicorn and a rose.

- Within two months, DNA testing confirmed the identity of the victim buried in Ohio as Paula Davis. Authorities now believe that her abductor was convicted serial killer Lorenzo Gilyard, although he has yet to be charged with Paula's murder.

Suggested Reading

Concannon, *Kidnapping*.

Douglas and Olshaker, *The Anatomy of Motive*.

Fox, *Uncommon Youth*.

Large, *Munich 1972*.

National Missing and Unidentified Persons System, <http://www.namus.gov/>.

Primorac and Schanfield, eds., *Forensic DNA Applications*.

Reeve, *One Day in September*.

Questions to Consider

1. What trace evidence might be found at the scene of a kidnapping to lead investigators to the perpetrators and/or victim?
2. Can you name other famous kidnappings and the motives for them?

Identification Matters

Lecture 23

In this lecture, we will look at six cold cases from Hamilton County, Ohio, spanning the years 1986 to the present. These cases have all been investigated by Project Identify, a cooperative effort among the Hamilton County coroner's and sheriff's offices, local media, and a team of students from Mount St. Joseph University. Project ID has reopened these cold cases using the National Missing and Unidentified Persons System (NamUs), a database that employs sophisticated computer algorithms to try to match missing and unknown persons. In this lecture, we'll follow the steps of Project ID team members in gathering information on these unknown victims.

The Settler

- On July 8, 1986, the Cincinnati homicide squad found the badly decomposed, partially skeletonized remains of what looked to be a middle-aged male in a vacant building in a rundown area of the city. There appeared to be no signs of foul play. Because the man had barricaded himself inside the building, he is referred to as The Settler.
- The body was transported to the Hamilton County coroner's office for an autopsy, but because of the degree of decomposition, the cause and manner of death were ruled undetermined, and fingerprints couldn't be obtained.
 - His remains weighed only 94 pounds, but that



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Some methods related to human identification haven't changed much over the last 30 years; visual observation of scars and tattoos, fingerprints, medical details from autopsies, and X-rays of skeletons are still used.

can't be used to estimate living weight. Both visual cues and mathematical formulas suggested that the victim was of African ancestry, and using the length of his femur, the man's height was estimated to be between 5' 6" and 5' 10". The Settler was probably more than 50 years old. The poor state of his dental health was thought to reflect a low socioeconomic status.

- Local missing persons files were consulted in 1986, and five possibilities were checked out, but no identification was made. The final note in the record indicates that full-body X-rays were taken and clothing was fully photographed before disposal, but these records were later destroyed in routine purges.
- The Settler's remains were buried in Wesleyan Cemetery in Cincinnati, a facility with a history of poor recordkeeping.
 - In the summer of 2013, students from Project ID teamed up with civil engineering interns from Cincinnati State to try to map the portion of the cemetery where records indicated The Settler was buried. Unfortunately, there are few headstones in the area, and his grave probably never had one.
 - Further, even if the grave could be located and a DNA sample could be obtained from the skeleton, it seems unlikely that a relative would come forward and contribute a sample for comparison.
 - Given that The Settler was probably homeless and may have barricaded himself in a building because he didn't want to be known by others, he will probably remain unidentified.

Broadway Doe

- On October 27, 1988, the crumpled body of a young man was discovered at the bottom of a stairwell leading to the basement of an apartment building on Broadway in downtown Cincinnati. The man was taken to University Hospital and pronounced dead on arrival.

- Although the exact time of death wasn't known, Broadway is a busy downtown street, and the man probably hadn't been dead for more than a few hours. He was fully dressed but had no identification.
- An autopsy revealed the cause of death as blunt-force trauma to the head of an undetermined manner, meaning that his death could not be ruled a homicide, suicide, or accident. There was no way to know whether he had fallen down the stairwell or had been pushed, but toxicology revealed that his blood-alcohol level was .08 percent, which is the current legal limit for intoxication.
- This 20- to 30-year-old man, referred to as Broadway Doe, had a completely recognizable face. He had been healthy, weighed 137 pounds, and was 5' 8" tall. A full set of fingerprints was taken, his blood type was noted as O-positive, and he was fully photographed. A police artist's sketch of the man's face was released to the local media, but no one came forth with information. His body was kept in storage at the Hamilton County Coroner's Office for five months before being buried in Wesleyan Cemetery in March 1989.
- In 2009, Broadway Doe's autopsy report, dental chart, and photographs were still available in the coroner's office. Amazingly, in 2013, a DNA analyst at the coroner's crime lab found an envelope containing a blood card from Broadway Doe—a paper record impregnated with drops of blood that can be used for testing—and the NamUs DNA lab was able to generate his genetic profile.
- The profile has been uploaded into the Combined DNA Index System (CODIS), a national DNA registry. CODIS is a self-searching database, with algorithms that automatically search all of its records against each other. Unfortunately, there has not yet been a hit for Broadway Doe.

Tracks

- On May 27, 1992, at about 10:35 a.m., train yard workers phoned the Cincinnati Fire Department to report a man lying along the tracks. An emergency squad took the man—who reportedly smelled

of alcohol and was unresponsive—to University Hospital, where he was admitted in a coma. Physicians determined that he had suffered a stroke; the man never regained consciousness and was removed from life support.

- An autopsy showed that the man, who came to be called Tracks, suffered from numerous illnesses. He was a black man, estimated to be in his 50s or 60s; he was 6' 1" and weighed 206 pounds. Other than the stroke, there was no evidence of injuries; thus, the man's death was ruled to be from natural causes.
- In 1992, missing persons records from both Hamilton County and the City of Cincinnati were checked, but no one came forth with information. When Project ID team members reopened the case, an autopsy report was available, but there were no dental records, fingerprints, DNA samples, or even photographs. A record from the emergency responders seems to indicate that the man's first name was Bill, but his last name is unknown.
- In March of 2014, the grave of Tracks was opened, and his DNA profile is now being generated. In addition, a forensic artist will reconstruct his facial appearance.

Riverman

- On May 17, 2003, a tugboat operator reported a body floating in the Ohio River near the city's public landing. The deceased was an unknown black male, who was badly decomposed.
- The body was brought to the Hamilton County morgue for an autopsy, but there were no obvious injuries, and neither the cause nor manner of death could be determined. Riverman was estimated to be between 20 and 40 years old; he was 6' tall and weighed 220 pounds. The toxicology report showed no evidence of drugs or alcohol, but these results can be affected by decomposition.
- A forensic dentist conducted a complete dental examination; a full DNA profile was uploaded to CODIS; and one viable fingerprint

was uploaded to the FBI's Integrated Automated Fingerprint Identification System (IAFIS).

- One entry in the death investigator's portion of the record indicates that five days before Riverman's body was discovered, a pair of concerned citizens had reported seeing a black male jump from one of the bridges that span the Ohio River in Cincinnati. Although that man was probably this victim, his identity is still not known.

Pearl

- On November 29, 2006, another body was found in the Ohio River, this time, by workers at a grain shipping facility. The body was that of a woman, who was estimated to have been dead a day or two at most.
- The woman, known as Pearl, was white and 50 to 70 years old; she was 5' 2" and weighed 134 pounds. Her death was due to drowning, but no one knows whether she fell in the water or was pushed. Investigators believe that she may have been a passenger on one of the local gambling riverboats or sightseeing cruises.
- Why no one reported Pearl missing remains a mystery. Perhaps the person who might normally be looking for her—a husband or boyfriend—is the one responsible for her death.

The Traveler

- On January 5, 2009, completely skeletonized remains were found under some brush in a wooded area near a major highway in Hamilton County. Some badly tattered clothing and two rings were associated with the remains.
- The remains were identified as belonging to a Caucasian female, who stood between 5' 1" 5" and 5' 6" tall. Using methods developed to assess aspects of the ribcage and pelvis—two areas that demonstrate specific age-related changes—she was estimated to be between 40 and 65 years old when she died.

- Other noteworthy features included a poor state of dental care and rugged landmarks on the muscle-attachment sites of her lower limbs, which suggested that she spent a great deal of time walking; possibly, she was homeless. The remains had probably been by the highway for many months, if not years. DNA samples were submitted to the NamUs DNA lab for upload to CODIS.
- The Traveler's remains are still available at the Hamilton County morgue. In the spring of 2013, members of Project ID and other students visited the site of her discovery. Surprisingly, a few more small bones were found, as well as an upper denture that the forensic dentist was able to fit to the woman's skull.
- The findings of an anthropology exam, along with the skull and denture, were provided to a forensic artist in Florida who does reconstructions for unidentified dead in the NamUs system. By the summer of 2013, an image was available for a new press release that was heavily covered by the media. Sadly, no new information has been forthcoming.

An Identification Success Story

- On June 24, 1975, the decomposing body of an unknown drowning victim was discovered in the Scioto River in Ross County, Ohio. He was a white male; 5' 11" tall; weighing around 150 pounds; and with an age estimated between 30 and 65 years. His body was autopsied the next day at the Hamilton County coroner's office, and when no identity could be confirmed after four months, the remains were released for burial as a John Doe.
- In late 2009, a NamUs record was started for this man, and in November 2011, his body was exhumed for DNA testing and a thorough dental exam. His skull was sent to a forensic artist, and the image of the clay reconstruction she created was released to the media.
- A woman saw the image in the newspaper and contacted authorities. In September of 2012, based on DNA comparison with

a family member, the man was identified as 40-year-old Arthur Raymond Flowers, a veteran who had last been seen at a VA hospital, where he was being treated for depression. Mr. Flowers's niece was finally able to bring Arthur home to his family, 37 years after he disappeared.

Suggested Reading

Bass and Jefferson, *Death's Acre*.

Mallet, Blythe, and Berry, eds., *Advances in Forensic Human Identification*.

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Primorac and Schanfield, eds., *Forensic DNA Applications*.

Rathbun and Buikstra, *Human Identification*.

Steadman, *Hard Evidence*.

Questions to Consider

1. Had you heard of the National Missing and Unidentified Persons System prior to this course?
2. What are some of the ways forensic scientists reopen and reinvestigate cold cases involving unknown persons?
3. What types of specialists/specialties do you think are involved in working together to find missing persons and identify unknown persons?

The Past, Present, and Future of Forensics

Lecture 24

Neither criminal motives nor the tendency of some members of society to engage in aberrant behavior has changed much over human history; it is the materials and technology used—both to commit crimes and to solve them—that transform over time. Because humans are by nature scientific beings, we continue to explore new technologies to enhance our understanding of what goes on around and inside us. Forensics is no exception and has prompted and capitalized on many scientific advances. In this lecture, we'll look at three essential tools used heavily today in forensics and see how they've changed over time and continue to move science forward: fingerprinting, DNA analysis, and computer technology.

Fingerprinting

- Fingerprints have the longest history as a physical means of identifying both offenders and victims in forensics. In the 1880s, two British scientists who had been studying prints, Henry Faulds and William Herschel, published papers on their individuality. This led the British anthropologist Francis Galton to start promoting the acceptance of fingerprints as forensic evidence in court.
 - Around this same time, an Argentine police officer named Juan Vucetich used fingerprint evidence to solve a murder in which a woman killed her two sons and was identified because her prints were left behind using their blood.
 - A few years later, London Police Commissioner Edward Henry developed a fingerprint classification system that was adopted by Scotland Yard and is, in essence, still used today.
- The oldest method of revealing latent fingerprints (those that aren't obvious to the eye) goes back to 1863, when French professor Paul-Jean Coulier published a paper on the use of iodine fuming. Iodine fuming is still used today, especially on valuable paper items that would be damaged by other methods. Much later, in 1977, a

Japanese police scientist named Fuseo Matsumur discovered that the cyanoacrylate in superglue developed latent fingerprints.

- In 2008, British scientist John Bond discovered that acids in a person's sweat can etch a fingerprint into metal, especially brass, by corrosion. The etching causes a permanent change in the surface of the metal, meaning that fingerprints may still be present on, for example, bullet shell casings, even if the shells were wiped clean before being loaded into a gun. The heat from firing a bullet or from the explosion of a bomb actually enhances the corrosion. One negative issue here is that the process used to develop metal corrosion fingerprints creates problems for collecting DNA present on the metal.
- In 2013, the University of Leicester announced the testing of a new latent print development method for metals that should allow prints to be recovered from weapons months or perhaps years after a crime, even if the surface has been wiped clean.
 - At present, only about 10 percent of recovered prints are of sufficient value to be used in court, but if this new method works, researchers believe that it will allow twice as many fingerprints to be recovered, while not damaging the potential for DNA testing.
 - The technique involves putting the object into a liquid containing a fluorescent dye that, when an electric current is applied, will stick to metal that wasn't touched, rather than the print itself. Essentially, the residue from the fingerprint insulates the metal beneath it, and investigators are left with a negative of the latent print that can be reversed digitally.
- Nanotechnology is projected to be the new frontier of fingerprint development and analysis. Chemical methods will be downsized to the nano level to improve the sensitivity of existing methods. Even more intriguing uses of nanotechnology are also proposed. For instance, antibody-like nanoparticles could be engineered to link to and detect nicotine, cocaine, marijuana, or heroin in a user's sweat.

That would give investigators a window into a person's life that could help narrow the search for either a criminal or a victim.

Developments in Serology

- Today's DNA analysis has its historical roots in serology, which is the general study of body fluids. Microscopy is one important aspect of forensic serology, and microscopes—in one form or another—have been around since the 1600s. The first forensic application came in the late 1830s, when French forensic pathologists perfected the use of the microscope to reliably detect sperm.
- In 1853, a Polish anatomist working in Germany developed the Teichmann test, which is named after him. This method crystallizes certain components of the hemoglobin in blood, and these crystals can be viewed under a microscope. The Teichmann test is confirmatory, meaning that if crystals form, the substance is definitely blood. In the 1860s, scientists from the Netherlands and Germany generated presumptive tests for blood; these are quicker tests that might be done in the field but require follow-up testing in a lab.
- Another major milestone on the way to DNA technology occurred in 1901, when Karl Landsteiner, an immunologist from Austria, identified the ABO system of human blood types; his colleague, Max Richter, determined how to detect blood type on stains for use in forensics.



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Both presumptive field tests and confirmatory lab tests are important in detecting the presence of blood.

- Soon after, a Japanese researcher named Masao Takayama created another reliable test for the presence of hemoglobin in bloodstains. And by 1925, a second Japanese scientist first recognized that some people display their blood type in other body fluids, such as semen or saliva. These individuals became known in forensics as *secretors*.
- The chemical luminol, used at crime scenes to detect blood that is not visible to the naked eye, was developed by a German forensic scientist in 1937. Throughout the 1960s, research that spanned the globe led to further refinements in serology.

DNA Analysis

- The 1953 discovery of the chemical structure of DNA by James Watson and Francis Crick was essential to all forensic DNA analytical methods to come. It wasn't until 1980, however, that genetic researchers discovered what are known as the *hypervariable regions* in human DNA that are different enough among people to be used in forensics.
- Soon after that came nuclear DNA fingerprinting by Alec Jeffreys of the United Kingdom. In 1986, American biochemist Kary Mullis invented the polymerase chain reaction method that's still used today in a modified form to make mass copies of desired segments of DNA, allowing even small samples to be compared.
- DNA testing methods changed again in 1992 when a biochemistry professor in Texas determined that regions of DNA known as *short tandem repeats* (STRs) could be used in forensics. The resulting STR type of DNA fingerprinting means that very small and degraded samples can still net a genetic profile. By 1996, the first criminal case to use mitochondrial DNA analysis was tried in the United States.
- The most recent advance in DNA testing is *touch DNA*. With this method, only 5 to 10 skin cells are needed to generate a useful DNA profile. This method was used to exonerate the parents and brother

of JonBenet Ramsey in her murder in 1996 and played a role in the investigation of Caylee Anthony's death in Florida in 2008.

Computer Technology

- As in countless other fields, computers have changed much of the work in forensic science. Today's forensic labs are filled with computerized equipment for toxicological studies of body fluids and tissues and analyses of suspected drug samples, accelerants from arson cases, automotive paints from hit-and-run accidents, and more.
- In such fields as forensic anthropology, accounting, and engineering, computer software has greatly enhanced and sped up assessments. Digital methods have also revolutionized forensic art, not only in terms of the speed with which a facial reconstruction or police sketch can be made but also in the ease of adjusting the results to show variations in appearance.
- Computers have been used in forensics to create *demonstrative evidence*, such as an accident reconstruction, the projected path of a bullet, or a model of a fall from a tall building. Forensic engineers use computer modeling to help assess why a building or bridge collapsed or where a fire started.
- With global positioning systems, computers allow the precise mapping of evidence, such as the locations of body parts in a mass disaster. Three-dimensional digitization and printing allow replicas to be made of skulls and other evidence. Digital X-rays and scanning enable scientists to rapidly transfer detailed images. Computer power can also enhance recognition of criminal patterns, such as might be used by a forensic profiler or behavioral analyst.
- Research conducted by experts in digital forensics has led to advancements in crime scene photography and video documentation of scenes and suspects. Digital experts can enhance poor-quality images and sounds and determine whether stored digital information

has been altered. They can develop latent digital evidence, such as data on a computer hard drive that may have been erased.

- One significant application of computers in forensics has been in the realm of comparisons, such as of fingerprints and other image-based evidence. Facial recognition software can pick a person out of a crowd photograph, and digitization allows comparison of voice and other sound patterns. Large databases containing comparative evidence are now routinely used in all types of forensic investigations.

Computers and Crime

- Of course, computers have also changed and enhanced crime. *Cybercrime* includes bank thefts and corporate embezzlement, identity theft, and hacking and virus attacks on governmental, financial, and media entities. Just as the Internet has provided worldwide assistance to solve crimes, it has also allowed individuals to essentially cross borders and other jurisdictional lines to commit crimes without ever leaving home.
- In one cybercrime that took place between July and October of 1994, more than \$10 million was stolen from a U.S. bank. This robbery was perpetrated by a worldwide group of hackers who tapped into the bank's cash management system. Ultimately, the leader of the operation, a Russian named Vladimir Levin, was extradited to the United States and pled guilty at trial. This case is thought to be the first-ever online bank robbery.
- In mid-May of 2014, law enforcement officials in 19 countries announced a global takedown of cybercriminals. This sting was related to malware known as the Blackshades Remote Access Tool (RAT), which had been used by thousands of hackers to steal passwords and access codes from unsuspecting computer users.
- Finally, a case that illustrates how innovative and diverse computer crimes can be was the coordinated attempt to hack into a pay-per-view TV system over the course of several years in the 1990s.

Allegedly, the motive behind the attempts was to enable the hackers to watch *Star Trek* reruns for free. Undoubtedly, computers will continue to provide new opportunities both for those who commit crimes and for those who solve them well into the future.

Suggested Reading

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Thies, *Cybercrime: Digital Forensic Investigations*.

U.S. Department of Justice, National Institute of Justice, *Latent Print Examination and Human Factors*.

Questions to Consider

1. What are some of the other major innovations in forensic science other than the three referred to in this lecture?
2. Do you have predictions for the future of forensic science?

Bibliography

Note: Some of the following references contain graphic images.

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